

PVC EQUESTRIAN POST & RAIL FENCING

Technical Specification: 76 × 76 mm Square Rail System

1. System Description

The Value Fencing® 76 × 76 mm PVC Equestrian Post & Rail System is a smooth-surfaced, highly visible ranch-style fencing system intended for horse paddocks, equestrian estates, stable yards, riding facilities, pathways, property boundaries and related agricultural or lifestyle applications.

The system comprises:

- 76 × 76 mm square hollow PVC rails.
- 102 × 102 mm square PVC posts.
- CNC precision-cut rail slots in the posts.
- Reinforced, concrete-filled PVC posts.
- Concrete foundations around all planted posts.
- Matching end posts, line posts, corner posts and gate posts.
- Matching pedestrian, paddock and equipment-access gates where required.
- One-, two-, three- or four-rail configurations according to the intended application.

Value Fencing® currently offers equestrian fencing in one-, two-, three- and four-rail configurations. The 76 × 76 mm square rail provides the traditional square timber-post-and-rail appearance while retaining the smooth finish and low-maintenance characteristics of rigid PVC fencing.

For this specification, the terms PVC, uPVC and vinyl fencing refer to the rigid, UV-stabilised PVC profiles used in the Value Fencing® system.

2. Primary Design Objectives

The system must be designed and installed to provide:

- A clearly visible physical boundary for horses.
- A smooth surface without splinters, sharp wire, exposed fasteners or projecting steel.
- Appropriate containment for the type, size, temperament and number of horses.
- Safe rail spacing that minimises foreseeable hoof, head or leg entrapment.

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- A rail configuration appropriate to the paddock size and anticipated horse pressure.
- Reinforced posts capable of supporting normal fence loads.
- A controlled rail-release option where horse-impact safety is prioritised.
- Convenient inspection, replacement and reinstatement of individual rails.
- Long-term outdoor durability with minimal routine maintenance.

Horse-fencing guidance emphasises that fencing should be substantial and highly visible because horses scan towards the horizon and may not readily identify thin or poorly visible barriers.

3. PVC Rail Specification

3.1 Rail profile

- Profile size: 76 × 76 mm square.
- Standard overall rail length: 1,890 mm.
- Material: Rigid, UV-stabilised PVC fencing profile.
- Finish: Smooth, non-splintering external surface.
- Rail orientation: Horizontal.
- Rail ends: Square cut and free from sharp edges or burrs.
- Rail wall thickness and profile mass: In accordance with the current Value Fencing® approved extrusion specification.

3.2 Rail engagement into posts

Each rail must enter the CNC-cut slot in the adjoining post by approximately:

- Minimum target engagement: 25 mm.
- Maximum target engagement: 30 mm.
- Engagement applies at both ends of every rail.

With a 1,890 mm rail and approximately 25–30 mm insertion at each end:

- Approximate clear distance between opposing post faces: 1,830–1,840 mm.
- Approximate post centre-to-centre setting-out distance: 1,932–1,942 mm.
- Practical nominal setting-out module: Approximately 1,935–1,940 mm centre to centre.

The final post spacing must always be confirmed against:

- The actual delivered rail length.
- Actual post dimensions.

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- CNC slot depth.
- Manufacturing tolerances.
- Terrain and fence alignment.
- Approved Value Fencing® project drawings.

Posts must not be installed solely from an assumed spacing without checking the physical components.

4. CNC-Cut Post Openings

All rail openings must be:

- Precision cut by CNC equipment.
- Sized for the actual 76 × 76 mm rail profile.
- Positioned accurately according to the approved rail configuration.
- Cleanly cut without cracks, uncontrolled notches or sharp corners.
- Aligned on opposing faces of line posts.
- Cut on one face for end posts.
- Cut on adjoining faces for 90-degree corner posts.
- Custom cut where the fence changes direction, gradient or rail level.

The slot must allow the rail to enter and disengage as designed without excessive looseness.

Rails must not be permanently screwed, bolted, riveted, glued or pinned into the posts where the safety-release configuration has been selected.

5. Standard Safety-Release Rail Configuration

5.1 Design intent

In the standard equestrian configuration, the 76 × 76 mm rails remain hollow and are seated into the CNC-cut post slots without rigid mechanical locking.

The system is designed so that, under a significant abnormal impact—such as a horse running directly into or through the fence—a rail can unclip or disengage from the post opening rather than remaining an entirely rigid obstruction.

The objective is to:

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- Reduce the likelihood of a horse's leg becoming trapped behind a completely rigid rail.
- Reduce the risk of severe lower-leg injury associated with an immovable fence member.
- Avoid the splintering and protruding nails associated with damaged timber fencing.
- Allow an affected rail to be inspected and, where undamaged, reseated after the incident.

This feature is intended to minimise risk; it does not make any fence injury-proof and does not guarantee that injury cannot occur.

5.2 Conditions required for safety-release behaviour

For the intended rail-release function to remain effective:

- Rail insertion must remain approximately 25–30 mm at each end.
- Rails must remain hollow.
- Rails must not be filled with concrete.
- Rails must not contain continuous steel reinforcement.
- Rails must not be screwed or pinned to the posts.
- Adhesive must not be applied inside the rail slots.
- Slot dimensions must not grip the rail excessively tightly.
- Fence lines must be installed without forcing or preloading the rails.
- Damaged or distorted rails must be replaced rather than forced back into position.

5.3 Performance limitation

The system has an intended safety-release function, but no specific breakaway force, impact rating or guaranteed release load may be stated unless that particular configuration has been independently tested.

Factors that may affect rail release include:

- Direction and speed of impact.
- Rail temperature.
- Age and condition of the rail.
- Slot tolerances.
- Rail insertion depth.
- Fence alignment.
- Post movement.
- Previous impact damage.
- Whether rails have been mechanically secured or reinforced.

6. Reinforced-Rail Option

Where the client requires a more rigid or heavy-duty application, the 76 × 76 mm rails may be filled with reinforced 25–30 MPa concrete.

This option may include:

- Suitable continuous steel reinforcing bar within the rail.
- A controlled 25–30 MPa concrete infill.
- Proper compaction without damaging or distorting the PVC profile.
- Full curing before the rail is subjected to service loads.
- Sealed rail ends with no exposed reinforcement.

The reinforcing-bar diameter, concrete cover, rail support during casting and reinforcement termination must be confirmed by Value Fencing® or the appointed engineer for the particular installation.

Important safety consequence

Concrete and steel reinforcement substantially change the rail's mass, stiffness and impact response.

A reinforced rail:

- Must not be described as a breakaway or safety-release rail.
- May not disengage as readily during horse impact.
- Transfers greater loads into the posts and foundations.
- May require larger or deeper post foundations.
- May require additional reinforcement at end posts, corners and changes of direction.
- May increase injury risk if installed where horses can collide with it at speed.

The reinforced-rail option should therefore be selected only after considering whether structural rigidity or horse-impact release is the primary project requirement.

Recommended uses for reinforced rails

Reinforced rails may be considered for:

- Decorative ranch-style boundaries outside direct horse-contact zones.
- Estate entrances and landscaped road frontages.

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- Areas exposed to higher environmental or pedestrian loads.
- Non-equestrian demarcation.
- Sections protected by a separate internal horse barrier.
- Special structural applications approved by Value Fencing®.
- Locations where the client expressly prioritises rigidity over rail-release behaviour.

For active paddocks, galloping areas and riding arenas, the standard hollow safety-release configuration is generally the preferred 76 × 76 mm equestrian option.

7. Post Specification

7.1 Post profile

- Post size: 102 × 102 mm square PVC.
- Post type: End, line, corner, junction or gate post as required.
- Finish: Smooth UV-stabilised PVC.
- Top: Fitted with a matching post cap after concrete placement and inspection.
- Internal reinforcement: Reinforced concrete and steel reinforcing bars.

7.2 Post reinforcement

Every planted PVC post must be filled internally with reinforced concrete.

Value Fencing® equestrian product specifications commonly provide for two Y8 reinforcing bars, typically approximately 1,500 mm long where appropriate to the post length and installation. Final reinforcement length must suit the selected post, fence height, planting depth and site requirements.

Minimum requirements:

- Concrete strength: 25–30 MPa.
- Cement: 42.5 strength-class cement as prescribed by Value Fencing®.
- Reinforcement: Steel rebar properly positioned within the post.
- Concrete placement: Continuous and properly consolidated.
- No exposed reinforcing steel at the top or base.
- Post cap installed only after satisfactory filling and inspection.

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8. Post Planting and Foundations

8.1 Minimum planting depth

Posts must be planted:

- Minimum 600 mm below finished ground level.
- Preferably approximately 650 mm for normal equestrian installations where the selected post length permits.
- Deeper where required by soft soil, fill material, slopes, high wind exposure, corners, gates or greater fence height.

Certain current Value Fencing® equestrian post specifications call for approximately 650 mm planting depth. The 600 mm dimension must therefore be treated as the absolute minimum rather than the universal optimum.

8.2 Foundation concrete

The excavated hole around each post must be completely filled with:

- 25–30 MPa concrete.
- 42.5 strength-class cement.
- Properly graded clean aggregate.
- Clean mixing water.
- A controlled water-cement ratio.
- An approved accelerator where required.

Soil, loose rubble, dry cement, building debris or uncompacted spoil must not be used as substitute foundation material.

8.3 Foundation dimensions

Foundation diameter or plan dimensions must be determined according to:

- Soil-bearing condition.
- Fence height.
- Rail count.
- Horse pressure.
- Wind exposure.
- Ground slope.
- Proximity to drains or excavations.
- Whether the rails are hollow or concrete reinforced.

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- Whether the post supports a gate.
- Whether the post is an end, line, corner or junction post.

Gate posts, corner posts, termination posts and reinforced-rail posts may require larger foundations than standard line posts.

8.4 Concrete accelerator

A concrete accelerator is advised where early setting or early post stability is required.

Where steel reinforcement is used:

- The accelerator should be non-chloride and suitable for reinforced concrete.
- Dosage must comply with the admixture manufacturer's instructions.
- Trial batching may be required.
- The accelerator must not be added indiscriminately to dry cement.
- Normal curing remains necessary.

Commercial non-chloride accelerators are available specifically for reinforced concrete, and manufacturers advise trial mixes and recognised curing practices.

The use of accelerator reduces initial setting time but does not mean that the concrete has immediately achieved its full specified strength.

9. Concrete Quality Requirements

The concrete must achieve a specified compressive strength of 25–30 MPa.

For high-strength site-batched concrete, correct batching and controlled water content are essential. Excess water reduces concrete strength. A South African cement manufacturer's guidance for nominal 30 MPa concrete similarly stresses controlled proportions and using only sufficient water to obtain workable concrete.

Installation requirements include:

- Cement must be fresh and correctly stored.
- Sand and stone must be clean.
- Concrete must not be excessively wet.
- Concrete must be mixed until uniform.
- Post interiors must be filled without large voids.
- Foundation concrete must be consolidated around the post.

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- Posts must remain braced and plumb during early curing.
- Horses must be excluded until adequate concrete strength has developed.
- Full nominal concrete strength is assessed at 28 days.

10. Recommended Fence Heights

Fence height must be selected according to:

- Horse size.
- Horse temperament.
- Number of horses.
- Paddock size.
- Likelihood of jumping.
- Whether stallions, foals or ponies are present.
- Whether the fence is an internal division or external perimeter.
- Adjacent roads, hazards or public areas.

General international equestrian guidance commonly recommends approximately 1.25 m for ordinary horse fields, with horse-fence ranges around 1.08–1.38 m and higher fences for stallions or known jumpers. Some guidance recommends perimeter fences closer to 1.5 m for more secure containment.

Value Fencing® design ranges

- Decorative single rail: Height determined by landscape design; not recommended as sole horse containment.
- Two-rail light equestrian fence: Normally approximately 1.2 m high.
- Three-rail general paddock or arena fence: Normally approximately 1.35–1.5 m high.
- Four-rail or high-control fence: Normally approximately 1.5 m or project-specific.
- Stallions, jumpers or high-pressure boundaries: Project-specific design, potentially 1.5–2.0 m.

The final height must be approved before CNC cutting.

11. Rail Count and Practical Applications

11.1 One-rail system

Recommended for:

- Decorative ranch-style boundaries.
- Driveway edging.
- Equestrian-estate landscaping.
- Pathway guidance.
- Garden and property demarcation.

A single rail should not normally be used as the sole containment fence for horses.

11.2 Two-rail system

Recommended for:

- Large internal paddocks.
- Calm, mature horses.
- Lifestyle estates.
- Low-pressure grazing areas.
- Stable approaches.
- Equestrian pathways.
- Decorative horse-property boundaries.
- Internal rotational-grazing divisions where additional management controls exist.

The two-rail 76 × 76 mm style provides a clean traditional ranch appearance and maintains good visibility.

11.3 Three-rail system

Recommended for:

- General horse paddocks.
- Riding arenas.
- Lunge rings.
- Training facilities.
- Stud farms.
- Stable-yard enclosures.
- Smaller or more active paddocks.
- Areas requiring improved visibility and containment.

- Properties containing horses of different sizes.

The three-rail configuration is generally the preferred option where the fence has a primary containment function.

11.4 Four-rail system

Recommended for:

- High-control paddocks.
- Breeding facilities.
- Foal or pony areas, subject to safe gap design.
- Premium equestrian estates.
- Smaller turnout areas.
- Locations where reduced openings and maximum visibility are required.
- Horses that place greater pressure on the fence.

Rail spacing must still be checked to avoid creating openings capable of trapping a hoof, leg or head.

12. Rail Position and Spacing

As a general guide, the lower rail should normally be positioned approximately 500 mm above finished ground for standard horse paddocks. This must be adjusted for ponies, foals, uneven ground and project-specific safety requirements. The British Horse Society similarly recommends a general fence height of approximately 1.25 m with the lower rail around 0.5 m above ground.

Rail spacing must:

- Be visually consistent.
- Prevent unnecessarily large openings.
- Be suited to the smallest animal using the enclosure.
- Avoid a gap likely to trap a hoof or lower leg.
- Prevent horses from easily placing their heads between rails.
- Account for changes in ground level.
- Maintain the approved top fence height.
- Be confirmed before CNC manufacture.

Where foals, miniature horses or small ponies are present, additional rails or a specifically designed supplementary horse-safe barrier may be required.

13. Gates and Gate Positions

Gates must be designed as part of the fencing system and not treated as an afterthought.

Gate requirements include:

- Sufficient clear width for horses, handlers, feed vehicles and maintenance equipment.
- Reinforced gate posts separate from ordinary line-post design.
- Smooth hardware without sharp projections.
- Secure, horse-resistant latching.
- Hinges and latches positioned to minimise snagging.
- Gate frames reinforced according to gate width and weight.
- Adequate ground clearance without a hoof-trapping gap.
- Positioning on well-drained, firm ground.
- Avoidance of low points where mud and standing water accumulate.
- Avoidance of narrow corners where horses may crowd handlers.
- Safe swing direction and no dangerous trapping space behind an open gate.

Equestrian-facility guidance recommends gates large enough for equipment and several horses where appropriate, positioned away from low, wet areas.

Gate posts and foundations must be designed separately where the gate introduces substantial hinge, wind or impact loads.

14. Installation Procedure

Step 1: Site inspection

Before manufacture or installation:

- Confirm fence purpose.
- Identify horse types and numbers.
- Inspect soil conditions.
- Record slopes and changes in level.
- Locate gates, corners and junctions.
- Identify underground services.
- Identify drainage routes.
- Confirm access for concrete and materials.

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- Confirm whether rails will be hollow safety-release or reinforced.

Step 2: Survey and set-out

- Establish the fence line using string or survey equipment.
- Mark all end, corner, gate and line-post positions.
- Confirm nominal post centres against actual rail dimensions.
- Adjust bay lengths only with Value Fencing® approval.
- Avoid creating short, visually inconsistent bays at the end of a run.

Step 3: CNC manufacture

- Produce end, line, corner and special posts according to the approved schedule.
- Cut all rail slots using the approved CNC file.
- Label posts where the layout is complex.
- Confirm rail count and slot elevation before dispatch.

Step 4: Excavation

- Excavate each foundation to the required depth and size.
- Remove loose material from the base.
- Increase foundation dimensions where soil is weak or disturbed.
- Keep holes free of standing water before concreting.

Step 5: Post and rail assembly

- Install primary end, corner and gate posts first.
- Position line posts progressively.
- Insert rails approximately 25–30 mm into each adjoining post.
- Do not mechanically lock hollow safety-release rails.
- Check rail levels and post spacing continuously.

Step 6: Reinforcement and concrete

- Install the specified reinforcing bars.
- Fill post foundations with 25–30 MPa concrete.
- Fill the PVC posts internally with reinforced 25–30 MPa concrete.
- Compact carefully to eliminate major voids.
- Keep posts plumb and rails aligned.
- Brace the installation during initial setting.

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Step 7: Curing and protection

- Prevent horses from entering the fenced area during curing.
- Do not hang gates or apply excessive loads until adequate strength has developed.
- Maintain concrete curing in accordance with good practice.
- Fit post caps after filling and inspection.
- Remove braces only when posts are stable.

Step 8: Final inspection

Confirm:

- Correct fence height.
- Correct rail count.
- Correct rail insertion.
- Posts are plumb and aligned.
- Rails are level or follow the approved gradient.
- No sharp edges or exposed reinforcement.
- Gates operate smoothly.
- Latches are secure.
- Concrete is complete and free from obvious voids.
- Hollow safety-release rails have not been mechanically locked.

15. Sloping and Uneven Ground

On sloping sites, the fence may be:

- Stepped.
- Raked to follow the natural ground.
- Divided into shorter custom bays.
- Manufactured with project-specific CNC slot positions.

The selected approach must:

- Maintain safe openings below the lowest rail.
- Avoid abrupt changes that create entrapment points.
- Maintain adequate rail insertion.
- Prevent rails from being forced into stressed or twisted positions.
- Preserve the approved top height where containment is critical.

Severe slopes may require shorter rails, additional posts or custom corner geometry.

16. Electric Offset Line

Where horses habitually lean, rub or push against fencing, an appropriately installed offset electric line may be considered.

It must:

- Be clearly visible.
- Be installed with horse-safe components.
- Be positioned so that horses are discouraged from pressing against the PVC rails.
- Not interfere with rail-release behaviour.
- Not create a wire-entanglement hazard.
- Not be relied upon as the sole external perimeter boundary.

Equestrian guidance generally treats electric fencing as useful for internal divisions or as a secondary psychological barrier rather than the only secure outer boundary.

17. Inspection and Maintenance

Although PVC fencing requires little routine surface maintenance, equestrian fencing must still be inspected regularly.

Recommended inspection frequency:

- Visual inspection daily where horses are actively kept.
- Immediate inspection after a horse impact.
- Inspection after storms, flooding, fire or vehicle contact.
- Detailed inspection at regular property-maintenance intervals.
- Gate and latch inspection whenever horses are moved.

The British Horse Society recommends that horse fencing should ideally be checked daily.

Inspection points include:

- Rails fully seated into slots.
- Cracked, distorted or heavily scratched rails.
- Loose or leaning posts.

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- Exposed reinforcement.
- Damaged post caps.
- Concrete movement or cracking.
- Erosion around foundations.
- Sharp gate hardware.
- Loose hinges or latches.
- Vegetation obscuring the fence.
- Uneven ground creating dangerous gaps.
- Evidence of horses chewing, rubbing or pushing against the fence.

Cleaning should normally require only water, mild detergent and a soft cloth or brush. Abrasive tools and aggressive solvents must not be used.

18. Quantity-Planning Guide

Based on a nominal post spacing of approximately 1.935–1.940 m centre to centre:

- Posts: Approximately 0.52 line posts per fence metre, before adding ends, corners, junctions and gate posts.
- Two-rail system: Approximately 1.03 rail lengths per fence metre.
- Three-rail system: Approximately 1.55 rail lengths per fence metre.
- Four-rail system: Approximately 2.07 rail lengths per fence metre.

These quantities exclude:

- Wastage.
- Short bays.
- Corners.
- Gates.
- Changes in level.
- Damaged components.
- Special junctions.

Final quantities must be taken from an approved measured layout.

19. Application Selection Guide

Standard hollow safety-release rails are recommended where:

- Horses have direct access to the fence.
- Horses may gallop or play near the fence.
- The fence encloses an arena, paddock or exercise area.
- Reducing rigid impact and entrapment risk is a priority.
- Individual rails may need to disengage during an abnormal incident.

Reinforced rails may be considered where:

- Greater rigidity is more important than rail-release behaviour.
- The fence is outside direct horse-contact areas.
- The fence has a primarily decorative or architectural purpose.
- The installation is protected by a separate inner horse boundary.
- A project-specific structural application has been approved.

Project-specific assessment is required for:

- Stallions.
- Known jumpers.
- Aggressive or highly excitable horses.
- Foals and miniature horses.
- Shared boundaries between unfamiliar horses.
- Small high-pressure paddocks.
- Boundaries adjacent to public roads.
- Severe slopes.
- Unstable or waterlogged soil.
- Very exposed wind conditions.
- Reinforced concrete-filled rails.
- Wide or automated gates.

20. Exclusions and Limitations

The standard 76 × 76 mm equestrian system is not:

- A vehicle-impact barrier.
- A crash-tested barrier.

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- A security palisade fence.
- A pool-safety fence unless separately designed to the applicable requirements.
- A balustrade or fall-protection system.
- A substitute for site-specific engineering where unusual loads exist.
- Guaranteed to prevent every horse escape or injury.
- Intended to support tied horses, feeders, heavy equipment or climbing loads.

Horses must never be tied directly to a removable rail.

Barbed wire must not be incorporated into the system. Horse-welfare guidance warns that barbed wire can cause severe and permanent injury.

21. Client Decisions Required Before Manufacture

The client must confirm:

1. Fence location and total length.
2. Primary purpose: decorative, paddock, arena, pathway or perimeter.
3. Horse type, size, age and temperament.
4. One-, two-, three- or four-rail configuration.
5. Finished fence height.
6. Rail spacing.
7. Standard hollow safety-release rails or reinforced rails.
8. Number and width of gates.
9. Gate swing direction.
10. Equipment-access requirements.
11. Terrain and slope treatment.
12. Soil conditions.
13. Whether an offset electric line is required.
14. Special corner or junction conditions.
15. Any engineering or estate approval requirements.

22. Safety and Liability Statement

The Value Fencing® hollow 76 × 76 mm rail system is designed to permit a rail to unclip or disengage from its CNC-cut post opening during certain abnormal impacts. This feature is intended to reduce the rigidity of the obstruction and help minimise the risk of severe equine leg injury.

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It does not guarantee that:

- Every rail will release during every impact.
- A horse cannot be injured.
- A horse cannot become trapped.
- A horse cannot escape.
- The fence is suitable for every animal or site.

Concrete or steel reinforcement inside the rails materially changes this behaviour. Reinforced rails must therefore be specified, quoted and described as a separate rigid option.

The final fence design must consider the horses, site, terrain, adjacent hazards, gate use and management practices. Where abnormal loading, public-safety exposure or uncertainty exists, approval by a competent engineer and an experienced equestrian professional is recommended.

23. Concise Tender or Quotation Specification

Supply and install Value Fencing® PVC Equestrian Post & Rail Fencing comprising 76 × 76 mm square UV-stabilised PVC rails, each approximately 1,890 mm long, installed into CNC precision-cut openings in 102 × 102 mm PVC posts.

Each rail must engage approximately 25–30 mm into the adjoining post at both ends. Unless expressly specified as the reinforced-rail option, rails must remain hollow and must not be glued, screwed, riveted, pinned or otherwise rigidly locked into the post openings, thereby retaining the intended rail-release safety function.

Posts must be planted a minimum of 600 mm into natural ground, with approximately 650 mm preferred where post length and site conditions permit. Excavated foundations and the full internal post cavities must be filled with reinforced 25–30 MPa concrete manufactured using prescribed 42.5 strength-class cement. A compatible non-chloride accelerator is advised where early setting is required.

All posts must be correctly reinforced, aligned, plumb, capped and adequately braced during curing. Foundation dimensions, reinforcement, fence height, rail count, gate-post design and any reinforced-rail application must be adjusted according to site conditions and the approved Value Fencing® project specification.

The installation must present a smooth, highly visible equestrian boundary without sharp edges, protruding fasteners, exposed steel or uncontrolled openings capable of creating a foreseeable horse-entrapment hazard.