TWEED SHIRE COUNCIL

DEVELOPMENT CONSTRUCTION SPECIFICATION

C265

BOUNDARY FENCING

VERSION 1.2

SPECIFICATION C265 - BOUNDARY FENCING

CITATION

This document is named “Tweed Shire Council, Development Construction Specification C265 - Boundary Fencing”.

ORIGIN OF DOCUMENT, COPYRIGHT

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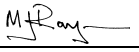
VERSIONS, C265 BOUNDARY FENCING

VERSION	AMENDMENT DETAILS	CLAUSES AMENDED	DATE ISSUED (The new version takes effect from this date)	Authorised by the Director of Engineering Services
1.1	Original Version		1 July 2003	
1.2	Replace all references to SWAC with "Certifying Engineer"	Various	5 February 2016	

DEVELOPMENT CONSTRUCTION SPECIFICATION C265

BOUNDARY FENCING

GENERAL

C265.01 SCOPE

1. This Specification is for setting out, clearing of fence line, supply of material and erection of boundary fencing and gates, in accordance with the design plans or as directed by the Certifying Engineer.

C265.02 REFERENCE DOCUMENTS

1. Documents referenced in this Specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated.

Documents Standards Test Methods

(a) Council Specifications

C212	-	Clearing and Grubbing
C271	-	Minor Concrete Works

(b) Australian Standards

AS 1289.5.4.1	-	Compaction control test - Dry density ratio, moisture variation and moisture ratio
AS 1725	-	Galvanised Rail-less Chainwire Security Fences and Gates
AS 1742.2	-	Traffic control devices for general use
AS 2423	-	Galvanised Wire Fencing Products

(c) Standard Drawings that apply to this Section

MATERIALS

C265.03 GENERAL

1. All materials shall be supplied by the Subdivider and shall be of dimensions, manufacture and quality in accordance with the approved design plans and the requirements of this Specification and all galvanised wire fencing products shall conform to AS 2423.

Dimensions and Quality

2. For each type of material to be supplied, the Subdivider shall submit to the Certifying Engineer for approval the source, manufacturer, and also the type if applicable.

Details to be Provided

3. No materials shall be used until approved by the Certifying Engineer.

Approved Materials

C265.04 GALVANISED POSTS AND BRACES

1. All posts and bracing shall be galvanised iron pipe in accordance with AS 1725. The pipes shall be to the dimensions shown on the design plans.

Dimensions

2. All pipe joints shall be welded. All welds shall be satisfactorily cleaned and painted with a cold galvanising compound to the satisfaction of the Certifying Engineer. ***Welded Joints***

C265.05 CHAIN WIRE

1. Galvanised chain wire mesh, 1,450mm wide (1830mm wide for Manproof Fencing) shall be of 3.15mm diameter wire woven to a 50 x 50mm square mesh. The selvedge edges of the chain wire shall be left barbed, and it shall be supplied in lengths of not less than 30m. The zinc coating shall be uniform, continuous, free from imperfections and thoroughly adherent. The coating shall be applied to the wire before the mesh is woven. The weight of the zinc coating shall not be less than 290 g/sq m of wire surface. ***Dimensions and Zinc Coating***

2. Where specified, the chain wire shall be coated in black PVC after galvanising. ***PVC Coating***

C265.06 WIRE NETTING

1. Wire netting shall be standard quality galvanised 1.40mm diameter wire, 40mm mesh, 1.05m wide for normal use and 1.60mm diameter wire, 50mm mesh, 0.90m wide where used in creek crossings. ***Dimensions***

C265.07 GATES

1. Gates shall be of galvanised tubular steel construction, 3.6 metres in width by 1.5 metres or 1.2 metres (as specified) in height, and shall be fitted with substantial hinges, catch, drop bolts and locking chains unless otherwise shown on the design plans or directed by the Certifying Engineer. ***Dimensions and Fittings***

2. Where required, gates shall have stout and well supported rabbit-proof mesh to a height of at least 900mm above ground level. ***Rabbit Proofing***

C265.08 REINFORCED CONCRETE POSTS

(a) Strainer Posts ***Dimensions***

1. Concrete strainer posts shall be approximately 150 x 150 square in section and lengths as shown on the design plans. Each post shall be provided with 12mm dia holes to suit the spacing of the wires shown on the design plans for the particular type(s) of fencing to be erected.

2. The posts shall be reinforced longitudinally with not less than four (4) reinforcing bars each 12mm diameter. All posts shall have suitable stirrup reinforcement to control diagonal cracking. Longitudinal reinforcement shall have 25mm minimum cover. End cover on reinforcement shall be 25mm. ***Reinforcing Steel***

3. The concrete shall have a minimum 28 day compressive strength of 20MPa. ***Concrete Strength***

(b) Intermediate Posts

1. Intermediate Posts shall generally conform to the requirements for Strainer Posts, except that the longitudinal reinforcing bars may be 9mm dia. ***Quality***

C265.09 PRESTRESSED CONCRETE POSTS

(a) Strainer Posts

1. At least four (4) longitudinal high carbon deformed high tensile strands (or equivalent) of 5mm diameter, shall be provided. The strands shall be tensioned to a stress of 800MPa minimum prior to placing concrete. Cross sectional dimensions of the posts shall be as shown on the design plans. ***Tendons***

2. Concrete shall have a minimum compressive strength of 32MPa at 24 hours. ***Concrete***

3. In lieu of holes for wires, grooves may be provided to suit the spacing of the wires shown on the appropriate design plans for the particular types of fencing to be erected. The grooves shall be at least 5mm deep and 5mm wide at the surface of the post. ***Grooves for Wire***

(b) Intermediate Posts

1. Intermediate posts and strainer stays shall generally conform to the requirements for Strainer Posts except that two (2) only high tensile, high carbon deformed strands shall be required. ***Quality***

2. Cross sectional dimensions shall be as shown on the design plans. ***Dimensions***

C265.10 STEEL POSTS (RURAL FENCING)

1. Steel posts shall be "STAR" pattern. Posts shall be drilled to suit the spacing of the wires shown on the design plan(s), and shall be black varnished or galvanised. ***Type***

2. The total weight of 300 posts each 1.65m long shall be at least one (1) tonne. ***Weight***

C265.11 GALVANISED PIPE POSTS (RURAL FENCING)

1. Galvanised pipe posts shall be used where shown on the design plans. The pipes shall be of the dimensions shown on the design plans and shall be of first grade quality in accordance with AS 1725. ***Dimensions and Quality***

C265.12 WIRES

(a) Plain Wire

1. Plain wire shall be standard galvanised drawn annealed steel wire of diameters shown on the design plans. ***Type***

(**b) High Tensile Plain Wire**

1. High Tensile wire shall be galvanised and of diameters shown on the design plans. ***Type***

(c) Barbed Wire

1. Barbed wire including barbs shall be 2.5mm diameter galvanised drawn annealed steel wire, with clusters of four (4) barbs spaced at 90mm maximum. Alternatively barbed wire may be of 1.6mm diameter high tensile steel wire, with clusters of barbs spaced at 90mm maximum. ***Type and Dimensions***

(d) Cable Wire

1. Cable wire shall consist of three (3) pairs of 2 x 3.15mm galvanised iron wire tightly twisted around posts and located as shown in the design plans. ***Type and Dimensions***

(e) Tie Wire

1. The wire shall be 2mm diameter galvanised wire. ***Type and Dimensions***

C265.13 CONCRETE BACKFILLING

1. All concrete backfilling of post holes specified on the design plans shall be of minimum 20MPa 28 day compressive strength and shall conform to the requirements of the Specification for MINOR CONCRETE WORKS. ***Specification***

CONSTRUCTION

C265.14 GENERAL

1. Boundary fencing shall be erected prior to the commencement of other work on a particular section of the work, unless directed otherwise by the Certifying Engineer. ***Construction Priority***

2. All fencing shall be erected in a workmanlike manner, and when completed shall be sound, strong and of neat appearance. ***Quality***

3. For a clear width of one (1) metre on either side of the fence line, and for the full length of the line, all logs, boulders, stumps, roots, undergrowth and rubbish shall be removed and disposed of by the Subdivider in accordance with the Specification for CLEARING AND GRUBBING. Trees within this area shall be removed only as directed by the Certifying Engineer. ***Clearing***

4. If trees on or adjacent to the fence line are to be retained the arrangement of the fencing at the trees shall be as directed by the Certifying Engineer. ***Trees Retained***

5. Wire shall not be strained around or against any trees to be left in the fence line, and strainer posts are to be provided on both sides of each tree. ***Trees on Fence Line***

6. Where minor irregularities occur in the ground the vertical alignment of the fence shall not follow these irregularities, but shall be aligned to a uniform grade between definite changes in the natural slope of the ground. ***Uniform Grade***

7. All survey pegs shall be left undisturbed and the post spacing shall be altered slightly where necessary to avoid pegs. ***Survey Pegs***

8. The Subdivider shall maintain the fencing at all times in a condition secure against the ingress or egress of stock, and shall take such precautions as are necessary to prevent people or stock from stepping into holes excavated for the construction of fencing. ***Stock Proof***

9. Where old fencing is to be replaced by new fencing, all holes left after removal of the old fencing shall be backfilled and rammed firmly in layers of maximum depth 150mm. ***Backfilling of Old Holes***

10. The Subdivider shall be held responsible for any loss, damage, or injury to buildings, goods, crops, livestock, property of any kind or persons due to negligence on the Subdivider's part. ***Subdivider's Responsibility***

C265.15 CHAIN LINK FENCING

(a) Erection of Posts

1. All posts shall be erected vertically and set in concrete blocks approximately 250mm diameter and 600mm deep except for end, corner, strainer and gate posts which shall be set in concrete blocks approximately 250mm diameter and 900mm deep unless otherwise shown on the design plans. Concrete shall have a minimum compressive strength of 20MPa at 28 days and shall conform to the requirements of the Specification for MINOR CONCRETE WORKS. ***Concrete Blocks and Quality***

2. Galvanised weather caps shall be fitted to all galvanised posts. ***Weather Caps***

3. Strainer posts shall be used at ends of fencing, angles, intersections with other fencing, gates and at intermediate points. Distances between strainer posts shall not exceed 120 metres. ***Strainer Posts***

(b) Erection of Wire

1. All wire shall be spaced as shown in the design plans. Wire shall be securely fastened and strained to an even tension between strainer posts. ***Fasten and Strain***

2. Where specified, or shown on the design plans, chain wire mesh shall be erected on the outside of the posts and fastened with two (2) turns of the wire to each cable wire on both sides of each post and at intervals of not more than 900mm between posts and to each post midway between cable wires. ***Chain Wire Mesh***

C265.16 STOCK-PROOF FENCING

(a) Erection of Posts

1. All posts shall be erected vertically. Reinforced concrete posts shall be erected in neatly cut holes sunk in earth, or in rock where this is encountered. Steel posts, except where placed in rock, shall be driven with suitable driving equipment, care being taken not to damage the tops of the posts during driving. ***Method***

2. Where prestressed posts are proposed to be used, they shall be either erected as for reinforced concrete posts or shall be driven. Where driven, the Subdivider shall use a suitable post driver which shall be equipped with two (2) sets of guiding rollers, to hold the post vertical and in position during driving. ***Driving Prestressed Posts***

3. A steel cap with a plywood cushion shall be used to protect the top of the post during driving. ***Protection Cap***

4. If the post cannot be driven for the full depth specified, or if it becomes significantly damaged, or cannot be driven vertically, it shall be removed. The same post if undamaged, or a new post, shall be erected as described for reinforced concrete posts. ***Removal of Posts***

5. Posts shall be sunk to the depths shown in Table C265.1.

Type of Post	Depth	
	Earth	**Rock**
Concrete Corner Posts & Strain Posts	900	*600
Concrete Intermediate Posts	600	*450
Steel Posts	450	450
Note* Permitted only in cases where posts of the correct length are provided (see below), otherwise the depth of sinking shall be the same as for earth.		

Table C265.1 - Post Depth in Ground

6. Cutting of concrete posts will not be permitted, and in order to take advantage of the lesser depth of sinking permitted in rock, it will be necessary to use posts manufactured in lengths to suit the depth of sinking. Where rock is encountered, steel posts shall be sunk in drill holes of sufficient diameter to permit them to be refilled with cement mortar consisting of one (1) part of cement to two (2) parts of clean sand. ***Variations to Post Length***

7. Earth shall be backfilled around intermediate posts in layers of maximum depth 150mm for the full depth of the hole and up to ground level. The relative compaction of the rammed material shall be not less than that of the original undisturbed ground. ***Backfilling at Intermediate Posts***

8. Where concrete posts are placed in rock, the space around the posts shall be tightly filled with cement mortar consisting of one (1) part of cement to two (2) parts of sand, or concrete where this is available. ***Mortar Backfill***

9. Strainer posts shall be used at ends of fencing, angles, intersections with other fencing, gates and at intermediate points. These posts shall be backfilled with approved concrete to their full depth. ***Strainer Posts***

10. Distances between strainer posts shall not exceed 120m in the case of fencing using steel intermediate posts, and 90m in the case of fencing for the retention of cattle (for which only concrete posts are permitted). Junctions with existing fencing shall be made in an approved manner. ***Spacing of Posts***

(b) Erection of Wires

1. All wire shall be placed as shown on the design plans. Wires shall be securely fastened and strained to an even tension between strainer posts with an approved wire strainer. Where barbed wire is to be used, it shall be tied in position at the top of intermediate posts, and where additional barbed wires are called for they shall be secured to the sides of the posts as shown on the design plans. ***Fastening and Straining***

2. Where concrete posts are used and the barbed wires are secured either to the tops or sides of the posts by tie wire, the tie wire shall be stretched tight and shall fit snugly against the sides of the posts to prevent movement of the barbed wire. ***Barbed Wire***

3. Where prestressed posts are used, wires shall be securely tied so that they seat firmly in the grooves. ***Prestressed Posts***

4. All joints in wires shall be as shown on the design plans. ***Wire Joints***

C265.17 RABBIT-PROOF FENCING

(a) General

1. Wire netting shall be erected on the side of the fence remote from the roadway in the case of road reserve boundary fences. In other cases netting shall be erected on the side of which the Certifying Engineer shall direct. ***Netting Position***

2. The netting shall be erected so that there is a 200mm lap laid on the ground surface, or trenched 215mm into the ground as shown on the design plans for the type of fence to be erected. ***Lap/Trench***

3. Netting shall be tied with tie wire or fixing clips approved by the Certifying Engineer. ***Fixing of Netting***

4. The netting shall be loosely tied to fence wires then carefully strained without disturbing or breaking the mesh, and shall then be tied to the wires immediately on each side of the post and at intervals not exceeding 1m. ***Straining and Tying***

5. At each strainer post strut, additional netting shall be attatched to the fence adjacent to the strainer post, to a height of 450mm above the strut. ***Additional Netting***

C265.18 CROSSING OF WATERCOURSES AND DEPRESSIONS

1. The crossing of all watercourses and depressions, shall be made secure by longer posts, suitably strutted as directed by the Certifying Engineer. Additional cable wire and chain wire/wire netting shall be provided as necessary to make the fence stock proof. ***Marsupial Proof***

2. The fence shall allow the passage of floodwater without the accumulation of debris. If directed by the Certifying Engineer, flood gates shall be provided in accordance with Clause C265.20. ***Floodwater***

C265.19 CONNECTIONS TO EXISTING FENCES

1. Existing cross fences shall be connected to the new fence using a strainer post with braces in each direction of strain (including cross fence) and the wires in both fences properly fastened to the post. ***Strainer Posts***

C265.20 FLOOD GATES

(a) General

1. Suitable provision for the passage of flood waters past the fence shall be made at all watercourses. In all cases flood gates shall be of the type indicated on the design plans, or as directed by the Certifying Engineer, and shall be erected so as to prevent the accumulation of flood debris, while remaining stock-proof or rabbit-proof. ***Requirements***

(b) Small Watercourses

1. Flood gates, in accordance with the design plans, shall be provided in small gullies at the locations indicated on the design plans or as directed by the Certifying Engineer. The opening of each flood gate shall provide a waterway area at least twice that of the culvert opposite to which it is placed, or as otherwise directed by the Certifying Engineer. ***Waterway Area***

(c) Large Gullies and Creeks

1. Flood gates, in accordance with the design plans, shall be provided in gullies and creeks at the locations indicated on the design plans, or as directed by the Certifying Engineer. ***Location***

2. A 9mm galvanised wire rope shall be carried over the gully in one (1) span, threaded through a strainer post and tied back to an anchor at an adjacent concrete intermediate post. Turnbuckles are to be provided at each end to tension the wire rope. Netting shall be suspended from the wire rope and shall be overlapped and securely tied. The netting shall be of sufficient length to lie on the ground for a distance of not less than 1.0m on the downstream side. ***Construction Detail***

3. Ballast, of sound timber securely tied to the netting, shall be provided at the downstream end of the netting. ***Netting Ballast***

4. The sides of the gully shall be trimmed, as necessary, to ensure that the flood gate shall be stock-proof or rabbit-proof. The flood gate shall have sufficient movement of the suspended portion under the flow of flood waters to prevent damage to the fence and the accumulation of debris against it. Each strainer post shall be stayed in three (3) directions, as shown on the design plans. ***Construction Requirements***

C265.21 ERECTION OF GATES

1. Where gates are specified or shown on the design plans, they shall be erected so that they swing away from the road. Double gates shall be supplied if directed by the Certifying Engineer, otherwise a single gate only shall be supplied. ***Swing Away From Road***

2. At the location of gates the surface shall be levelled and shall be nearly horizontal. The area where the gates swing shall be similarly levelled. ***Level Surface***

3. The gates shall be hung as indicated in the design plans. ***Hanging***

C265.22 REMOVAL OF EXISTING FENCING

1. Where required, existing fencing is to be removed as shown on the design plans. ***Location***

2. No fencing is to be removed if there is a risk of egress or ingress of stock. If the existing fence is a rabbit-proof fence, then the Subdivider shall ensure that at night and weekends and other such times when work is not in hand that the whole of the fence is maintained in a rabbit-proof condition, even if temporary fencing is required. ***Subdivider's Responsibility***

3. All material removed in demolishing existing fencing shall be disposed by the Subdivider as provided by Clause C265.23. ***Old Material***

C265.23 REMOVAL AND DISPOSAL OF SURPLUS MATERIAL AND RUBBISH

1. All surplus material, offcuts, timber, roots and other debris resulting from the fencing shall be removed or otherwise disposed of to the satisfaction of the Certifying Engineer. ***Subdivider's Responsibility***

2. The Subdivider shall be responsible for any damage which may result from the lighting of fires associated with the work. ***Fire Damage***

C265.24 CATTLE GRIDS

1. Where shown on the design plans, or as directed by the Certifying Engineer, cattle grids shall be erected in accordance with the design plans. ***Standard***

2. The cattle grid shall be evenly bedded on a continuous layer of compacted sand or other granular material approved by the Certifying Engineer. The bedding material shall be compacted so that the relative compaction as determined by AS 1289.5.4.1 is not less than 95 per cent. ***Bedding***

3. Cattle grids shall be installed on raised abutments with approach ramps where possible. Alternatively, a cattle grid may be placed over an excavated pit, in which case adequate drainage shall be provided. ***Raised Abutments***

4. Crossfall for single lane cattle grids shall be level and for two (2) lane cattle grids each section shall have a crossfall conforming to the crossfall of the approach road. ***Crossfall***

5. The cattle grid construction shall include all activities associated with the cattle grid including any adjustments to the fencing as shown on the design plans. ***Extent of Work***

6. Advance signposting, in accordance with AS 1742.2, shall be provided on each approach to the cattle grid in accordance with the Specification for SIGNPOSTING.

SPECIAL REQUIREMENTS

C265.25 RESERVED

C265.26 RESERVED

C265.27 RESERVED

C265.28 RESERVED

C265.29 RESERVED

C265.30 RESERVED