UGL REGIONAL LINX

# BOUNDARY FENCES

**CRN-STD-CVL-713026361-2283**

**CRN CS 510**

LINKING COMMUNITIES. CONNECTING CUSTOMERS.

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# Document Control

| Function | Position | Name | Date |
|---|---|---|---|
| **Approver** | A&E Manager | Lucio Favotto | 30.03.2022 |

| Revision | Issue Date | Revision Description |
|---|---|---|
| **1.1** | 02.02.2022 | UGLRL Operational Standards Template applied |
| **2.0** | 30.01.2022 | First approved and issued UGLRL version; for issue to website |
| **3.0** | 30.03.2022 | Update: reference to JHR deleted |

## Summary of changes made from previous version

| Section | Summary of change |
|---|---|
| **All** | This document is based on the previous rail infrastructure maintainer (RIM). Full revision history is available on request from UGLRL. |

# 1 Purpose, scope and application

This document specifies the requirements for the design, installation and maintenance of boundary fences on Country Regional Network (CRN) lines.

Boundary fences are provided to:

- afford a measure of security and safety by restricting unauthorised access to the right of way and rail infrastructure facilities
- discourage stock from entering the right of way
- mark the boundary of the right of way.

New fences shall be designed, constructed and maintained in accordance with this standard.

Existing fences that do not comply with the design requirements shall be upgraded when the fence is due for renewal, or when enhancement is required as determined by a risk assessment.

# 2 References

## 2.1 Australian and International Standards

AS 1725 Chain-link fabric security fences and gates

AS 2423 Coated steel wire fencing products for terrestrial, aquatic and general use

Unless otherwise specified, all references relate to the latest standard versions, including amendments and relevant superseding standards.

## 2.2 CRN documents

CRN CP 511 Boundary Fences

## 2.3 Other references

Legislation: Acts of Parliament for construction of various rail lines.

## 2.4 Definitions

See AS 1725 for definitions of fencing terms.

# 3 Engineering authority

Design and selection of infrastructure detailed in this standard for use on the CRN may only be undertaken by persons who have been granted appropriate Engineering Authority by the Principal Track and Civil Engineer

# 4 Requirements

All CRN lines are classified as fenced or unfenced lines in accordance with the various Acts of Parliament authorising their construction. In some cases, UGLRL CRN's predecessor rail organisations have exercised discretionary powers to construct boundary fences on lines where they were under no obligation to do so. For the purposes of the standard these discretionary fenced lines have been included in the "fenced line" category.

Fencing shall be installed and maintained on operational "fenced" lines. The Civil Maintenance Engineer may approve absence of fencing adjacent to seldom used bushland.

For the purposes of this standard "Fenced" and "Unfenced" lines in the CRN have been listed in Table 1 and Table 2, and are shown diagrammatically in Appendix 1.

The Acts of Parliament governing unfenced lines and the obligations this places on CRN are listed in Appendix 2.

| Fenced Lines | | |
|---|---|---|
| **Operational** | | |
| **South** | **West** | **North** |
| Joppa Jct to Queanbeyan | Bowenfels to Parkes | Werris Creek to Armidale |
| Queanbeyan to Canberra | Wallerawang to Kandos | |
| Stockinbingal to Temora | Orange to Dubbo | |
| Junee to Yanco | Narromine to Nyngan | |
| **Non Operational** | | |
| **South** | **West** | **North** |
| Queanbeyan to Cooma | Kandos to Mudgee | Armidale to Wallangarra |
| Culcairn to Corowa | Molong to Dubbo | Casino to Murwillumbah |
| Yass Town to Yass | Nyngan to Bourke | |
| Cootamundra to Gundagai | | |
| Narrandera to Jerilderie | | |
| Yanco to Hay | | |
| Blayney to Demondrille | | |

*Table 1 - Fenced lines on CRN*

| Unfenced Lines | | |
|---|---|---|
| **Operational** | | |
| **South** | **West** | **North** |
| Temora to Hillston | Talbragar to Coonamble | Narrabri to Walgett |
| Temora to Lake Cargelligo | Nevertire to Warren | Camurra to Weemelah |
| Ungarie to Naradhan | Nyngan to Cobar | Burren to Merrywinebone |
| Yanco to Griffith | Bogan Gate to Tottenham | |
| The Rock to Boree Creek | | |
| **Non Operational** | | |
| **South** | **West** | **North** |
| Goulburn to Crookwell | Mudgee to Gulgong | Sandy Hollow to Merriwa |
| Bungendore to Captains Flat | Binnaway to Gwabegar | West Tamworth to Barraba |
| Cooma to Bombala | Tarana to Oberon | Merrywinebone to Pokataroo |
| Galong to Boorowa | Craboon to Coolah | Weemelah to Mungindi |
| Gundagai to Tumut | Byrock to Brewarrina | Moree to Inverell |
| Gilmore to Batlow | | |
| Hillston to Roto | | |
| Barmedman to Rankin's Spring | | |
| West Wyalong to Burcher | | |
| Wagga Wagga to Tumbarumba | | |
| Uranquinty to Kywong | | |
| Boree Ck to Oaklands | | |
| Henty to Rand | | |
| Culcairn to Holbrook | | |
| Jerilderie to Tocumwal | | |

| Unfenced Lines | | |
|---|---|---|
| Koorawatha to Grenfell | | |
| Cowra to Eugowra | | |

*Table 2 - Unfenced lines on CRN*

UGLRL CRN has a statutory obligation to erect and maintain a fence sufficient to protect adjoining lands from trespass and to prevent stock on such adjoining land from gaining access to railway land.

On unfenced operational lines, where yards are fenced, they shall be maintained.

On non-operational fenced lines, fencing shall only be repaired or replaced at the request of the adjoining landowner, or where it is considered that there is the possibility of access to potential infrastructure hazards by the public. An assessment of the risk of injury shall be undertaken to determine if active risk mitigation strategies (e.g. fencing off structures) is required.

Cattle stops or grids allow track to pass through property boundary fences. UGLRL CRN shall maintain cattle stops. The private property owner maintains the fence up to the cattle stop, even though the fence is on railway land, except where a railway access gate is provided to allow construction of firebreaks etc. In this case, the fence between the gate and the cattle stop shall be maintained by UGLRL CRN.

Cattle stops can only be removed with the approval of the affected landholders.

Additional cattle stops shall only be installed with the approval of the Principal Track and Civil Engineer. Where possible this practice shall be avoided and the applicant encouraged to construct boundary fences along the railway boundary to permit division of paddocks without affecting the line.

In all types of fencing, access for infrastructure and corridor maintenance shall be considered. Wherever such access is warranted, gates shall be provided.

No gates are allowed in boundary fences adjoining residences.

# 5 Selection of fencing

UGLRL CRN shall restrict access to the rail corridor and rail facilities by the provision of appropriate fencing.

There are six (6) types of fences:

- Stock fence
- Residential fence
- Urban fence
- Enhanced Urban fence
- Security fence
- High Security fence.

A “Stock” fence meets UGLRL CRN’s statutory obligations and shall be installed as the default standard where fencing is required.

On fenced lines, UGLRL CRN shall contribute a 50% share for the erection or renewal of a “Residential” fence where UGLRL CRN managed land abuts a private residence or residential block. This does not apply to new developments where the land is rezoned from rural to residential.

In areas where trespass onto railway land may occur, it may be necessary to provide a superior fence. In such cases an “Urban” fence shall be provided.

The locations where an “Urban” fence may be erected are:

- Adjacent to roads were the running lines are close to the boundary.
- Along boundaries with recreation areas and schools.
- In shopping areas and where short sections of fencing occur in the urban areas.
- At locations where trespass is occurring.
- At locations where a road dead end abuts the railway fence and trespass is occurring.

“Enhanced Urban” fences shall only be erected where the added security given by the barbed wire is required.

The installation of “Security” or “High Security” fencing shall be approved by the Principal Track and Civil Engineer.

There are some locations where a site specific design will be required. The design shall provide functional performance equivalent to or better than the standard designs in this document.

Where practicable, structures adjacent to boundary fences shall be located and configured so that they do not to act as a climbing aid to the fence.

Where a retaining wall exists on the rail boundary, the appropriate standard fence shall be erected on top of the wall.

Concertina short-barbed tape shall only be used on top of fences with a minimum height of 2400mm.

# 6 Standard designs

## 6.1 Stock fence

The stock fence shall be one of the following approved configurations:

- Strand wire
- Hinged joint mesh with additional plain and barbed wires.
- Hinged joint mesh wire with flood gates

The fence shall comply with CRN Engineering Specification CRN CP 511 “Boundary Fences”.

## 6.2 Residential fence

The standard residential boundary fence is a hardwood timber paling fence.

A colourbond steel fence in accordance with manufacturer’s specifications, or urban fence may also be used.

Residential fences shall be 1800mm high.

The fence shall comply with CRN CP 511.

## 6.3 Urban fence

The urban fence shall be 1800mm high plain top chain-link fabric fence in accordance with AS 1725, which provides for four (4) standard configurations:

- Rail-less
- Top rail only
- Bottom rail only
- Top and bottom rail.

For fencing without top rail, bracing panels or bracing stays shall be used on all ends, corners and gateposts, and at 150m spacing on straight sections.

The fence shall comply with CRN CP 511.

## 6.4 Enhanced urban fence

Approved configurations for the enhanced urban fence are:

- extra heavy duty mesh in accordance with AS 2423 in the urban fence i.e. 25mm mesh size with 3.15mm diameter wire, or 50mm mesh size with 4.00mm diameter wire;
- attachment of 3 barbed wires on top of the urban fence;
- increased height of the urban fence to 2100mm in accordance with AS 1725;
- a 2100mm high tubular steel fence;
- a 2400mm high tubular steel fence.

The fences shall comply with CRN CP 511.

## 6.5 Security fence

Approved configurations for the security fence are:

- 2400mm / 2700mm high close spaced welded mesh fence
- 2400mm / 2700mm high palisade fence.

Tamper resistant, security-type fasteners shall be used.

The fence shall comply with CRN CP 511.

Other types of fencing may be used at specific sites subject to the approval of the Principal Track and Civil Engineer. The fence shall provide at least equivalent performance to the close space welded mesh fence.

## 6.6 High Security fence

Approved configurations for the high security fence are:

- 3000mm high close spaced welded mesh fence;
- 3000mm high palisade fence;
- 2400mm high close spaced welded mesh fence with 600mm concertina short-barbed topping.

The fence shall comply with CRN CP 511.

Fence products used in high security fences shall be endorsed by the Australian Government Security Construction & Equipment Committee.

## 6.7 Access gates

Access gates and locks shall comply with CRN CP 511.

# 7 Acceptance standards

All materials and components shall comply with the requirements of the relevant specified Australian Standard, or of CRN CP 511.

# 8 Installation requirements

## 8.1 Construction standards

Installation details for chain-link fences such as line and level, spacing of posts, footings, bracing panels/stays, connection of components and barbed wire extensions shall be in accordance with AS 1725 for chain-link fabric fences.

## 8.2 Connection with intersecting fences

Paddock dividing fences and private property dividing fences shall terminate on their own end post to the satisfaction of the owners. The connection between the private fence and the railway boundary fence shall be adequate for stock or trespass control.

## 8.3 Connection with bridges

At overbridges and footbridges, boundary fences shall provide a secure interface with bridge parapets, balustrades or protection screens.

## 8.4 Fencing on curves

Where the fence is required to be erected on an existing curved boundary, the fence shall be erected as a series of chords or tangents with the distance between posts reduced.

The length of the straight shall be determined for each location to reduce to a minimum encroachment on private property yet retaining adequate land for firebreaks, access and other UGLRL CRN requirements.

## 8.5 Fences at waterways

Where the boundary line is intersected by a permanent waterway, the fence shall be returned to the abutments of the bridge or culvert as a “wing” fence.

The location of the boundary fence across small variable flow waterways is difficult to define and each case shall be treated on its merits to, essentially, avoid flood damage to the fence and yet retain effective stock or trespass control.

Flood gates shall be avoided wherever possible by grading the ground surface to allow an even line of fencing without wire-netting or providing wing fences to the bridge abutment or culvert wing walls.

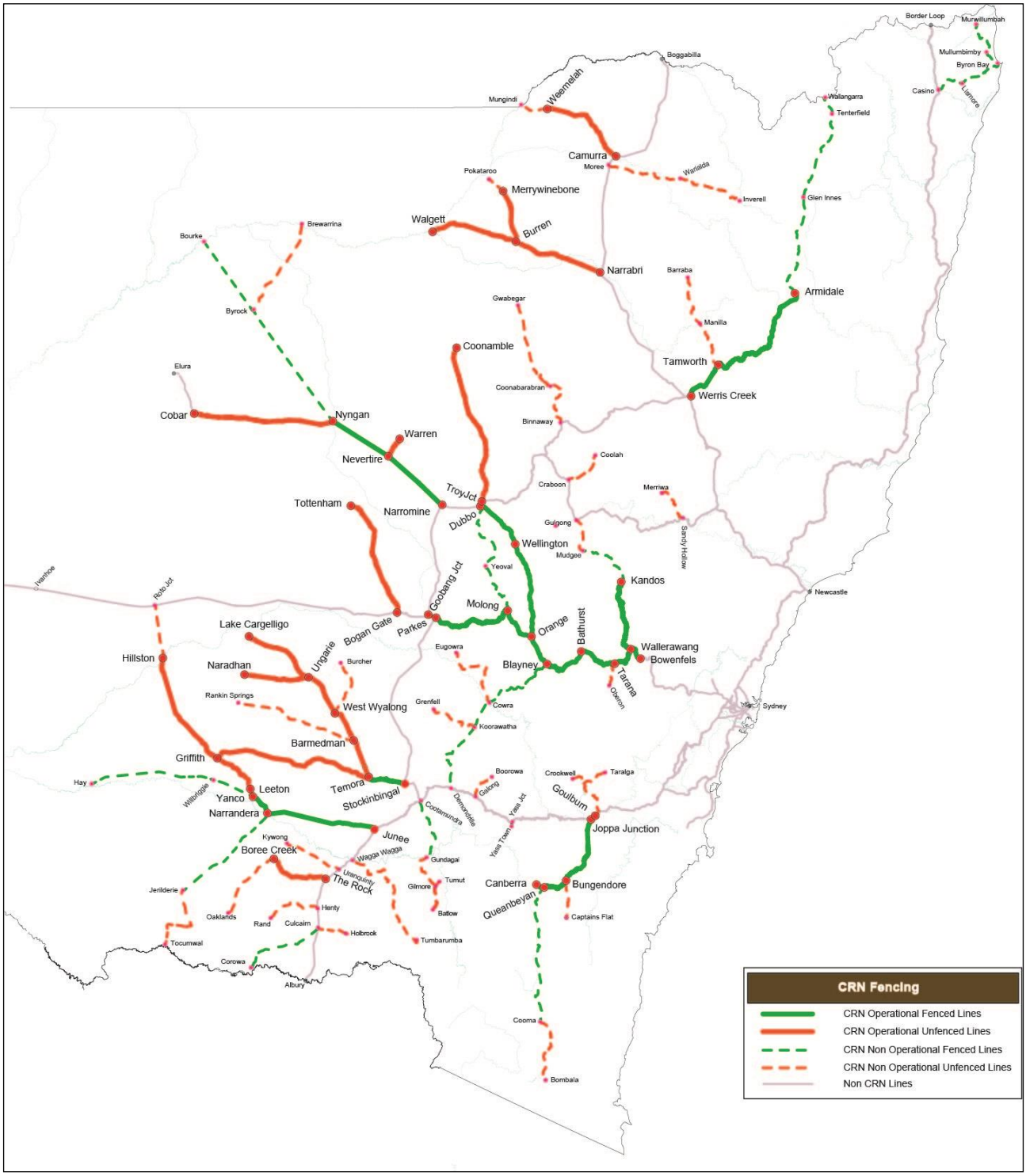
Where the installation of flood gates cannot be avoided, they shall be provided in accordance with CRN CP 511.

There are two standard designs for waterway flood gates:

- Standard small hinged flood gate
- Hinged flood gate for large creeks

The type of flood gate to be installed shall be selected to meet the requirements of waterway width. The small gate design is the default option, unless it is determined that the galvanize wire rope is unable to support the weight of the welded steel frame.

# Appendix 1 CRN fenced and unfenced lines



# Appendix 2 Fencing Acts

Origin of fenced lines

The various lines and section of lines comprising the railway system in New South Wales were constructed by authority of a series of Acts of Parliament. The lines thus authorised to be constructed were built in some cases by the Railways, and in other cases by the Public Works Department, but in every case the constructing authority was, as such, subject to the provisions of the relevant Construction Act, which imposes certain obligations, generally speaking, in the following terms:

"The Commissioner shall make and at all times thereafter maintain the following works for the accommodation of the owners and occupiers of lands adjoining the railway (that is to say) - sufficient posts rails, hedges, ditches, mounds or other fences for separating the land taken for the use of the railway from the adjoining lands not taken and protecting such land from trespass or the cattle of the owners or occupiers thereof from straying thereout by reason of the railway together with all necessary gates made to open towards such adjoining lands and not towards the railway and all necessary stiles and such posts, rails and other fences shall be made forthwith after the taking of any such lands if the owners thereof shall so require and the said other works as soon as conveniently may be".

Origin of unfenced lines

In the concluding years of the 19th century, Parliament decided, in many instances, to dispense with the obligation to erect fencing, and when authorising the construction of country lines, to include a Section negating the obligation to fence, which otherwise would have been imposed by the Public Works Act. Lines constructed under the authority of Acts containing this specific exemption, as well as a number of existing lines which were relieved from the obligation by statutory provision, are classified as "unfenced lines", while all other lines remaining subject to the requirements in the Public Works Act are classified as "fenced lines". It may be noted that for its own purposes the Railways have in fact, constructed boundary fences on certain lines, where by reason of the Construction Act, it was under no obligation to do so.

Table 3 lists the Acts of Parliament by which lines on the CRN were declared "unfenced". Lines that are legally "Unfenced" but are "Fenced under Discretionary Powers" are marked by □ .

| Line | Act |
|---|---|
| **South** | |
| Goulburn to Crookwell | Act No. 76 (1902) |
| Bungendore to Captains Flat | Act No. 23 (1930) |
| Cooma to Bombala | Act No. 23 (1908) |
| Galong to Boorowa | Act No. 2 (1912) |
| Gundagai to Tumut | Act No. 76 (1902) |
| Gilmore to Batlow | Act No, 20 (1919) |
| Temora to Hillston | Act No. 89 (1902 & Act No. 44 (1915) |
| Hillston to Roto | Act No. 38 (1929) |
| Temora to Lake Cargelligo | Act No. 50 (1901 & Act No. 76 (1912) |
| Wyalong to Wyalong Central | Act No. 76 (1902) |
| Barmedman to Rankin's Spring | Act no. 46 (1915) |
| Ungarie to Naradhan | Act No. 46 (1923) |
| West Wyalong to Burcher | Act No. 47 (1923) |
| Yanco to Griffith | Act No. 14 (1919) |

| Line | Act |
|---|---|
| Wagga Wagga to Tumbarumba | Act No. 18 (1911) |
| Uranquinty to Kywong | Act No. 33 (1930) |
| The Rock to Oaklands | Act No. 76 (1902) |
| Henty to Rand | Act No. 63 (1916) |
| Culcairn to Holbrook | Act No. 76 (1902) |
| Jerilderie to Finley | Act No. 76 (1902) |
| Finley to Tocumwal | Act No. 3 (1912) |
| **West** | |
| Mudgee to Gulgong | Act No. 35 (1906), Act No. 12 (1911), Act No. 12 (1913) |
| Binnaway to Gwabegar | Act No. 35 (1906), Act No. 12 (1911), Act No. 12 (1913) |
| Tarana to Oberon | Act No. 8 (1919) |
| Craboon to Coolah | Act No. 50 (1915) |
| Koorawatha to Grenfell | Act No. 76 (1902) |
| Cowra to Eugowra | Act No. 17 (1908) & Act No. 48 (1915) |
| Talbragar to Coonamble | Act No. 76 (1902) |
| Nevertire to Warren | Act No. 76 (1902) |
| Nyngan to Cobar | Act No. 76 (1902) |
| Byrock to Brewarrina | Act No. 76 (1902) |
| Molong to Dubbo ☒ | Act No. 59 (1916) |
| Bogan Gate to Tottenham | Act No. 88 (1902) & Act No. 13 (1911) |
| **North** | |
| Sandy Hollow to Merriwa | Act No. 11 (1911) |
| West Tamworth to Barraba | Act No. 76 (1902) |
| Narrabri to Walgett | Act No. 76 (1902) |
| Burren to Pokataroo | Act No. 76 (1902) |
| Camurra to Mungindi | Act No. 10 (1909) |
| Moree to Inverell | Act No. 76 (1902) |

*Table 3 - Acts detailing unfenced lines*