Appendix H

Powerlink Guidelines

Transmission Line Access Track – Guideline

Policy stream	Asset Management	
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Version history

Version	Date	Section(s)	Summary of amendment
1.0	08/03/2010	New Document	Original version
2.0	17/06/2016	All	Update AM-STA-0784 to new document management framework
3.0	25/06/2018	1.6 and 1.7	Inclusion of monitoring and risk management sections and updating relevant positions
3.1	13/08/2018	Header	Document type changed from a work instruction to a guideline.
3.2	28/03/2019	All	Format check as per review due date. Non-material change.
3.3	12/10/2021	All	Changes in organisational structure only – non-material.
3.4	26/10/2021	Title	non-material change update to title to clarify purpose of document

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1. Introduction

Transmission line access typically crosses land owned by other parties and sometimes goes off easements. As a result, the application of this guideline needs to be considered in the context of:

- the surrounding land use;
- whether access is off easements;
- whether works need to be performed outside of existing access track disturbed areas;
- budget constraints;
- providing safe access;
- compliance obligations; and
- landholder constraints.

1.1 Purpose

To outline the requirements for transmission line access tracks where they are constructed and maintained by Powerlink.

1.2 Scope

The scope of this document applies to all access constructed and maintained by Powerlink to gain access to Powerlink transmission line assets.

1.3 References

Document code	Document title
ASM-SPE-A2358094	Physical Access to Assets Guideline
Electricity Act	Electricity Act *1994* (Qld), sections 140A and 140B

1.4 Defined terms

Terms	Definition
Off easement access	Where access tracks are located off Powerlink's transmission line easements and transmission assets exist on the property, any work must be performed in consultation with the landholder.
On easement access	Where access tracks are located on Powerlink's easements, landholder consultation would only be required for new access track formation or deviations from existing tracks.
Associated properties	Where access tracks are formed on land that has no easements or transmission assets. Landholder consultation is needed for any works, even maintenance of existing access tracks.

1.5 Roles and responsibilities

Who	Responsible For
Group Manager Asset Strategy and Planning	Setting standards for accessing assets
Group Manager Field Delivery	Implementing access standards as part of field delivery

Who	Responsible For
Group Manager Service and Supply Partners	Auditing that access standards have been implemented in the maintenance phase, including Ergon Energy
Group Manager Technical and Network Solutions	Aligning technical and network solutions with access standards
Group Manager Infrastructure Delivery	Implementing access standards as part of Infrastructure Delivery
Group Manager Design Solutions	Aligning design and other technical services with access standards
Group Manager Community and Delivery Services	Aligning community and delivery services with access standards

1.6 Monitoring and compliance

Monitoring and compliance should be evaluated at the different stages of the asset life cycle as part of quality assurance processes for land assets.

1.7 Risk management

The following risk assessment summarises identified risks with transmission line access:

Technical Issues Related Hazards	Risk	Risk Controls
Ground access is not available to transmission line	Significant E6	• Construct access in accordance with this work instruction • Perform routine inspections of the condition of the access tracks • Perform maintenance and refurbishment works • Consider access track conditions when performing project work
Vehicle roll over, resulting in a fatality	Significant E6	• Construct access in accordance with this work instruction • Perform routine inspections of the condition of the access tracks • Perform maintenance and refurbishment works • Consider access track conditions when performing project work

Technical Issues Related Hazards	Risk	Risk Controls
Erosion of access	Significant B3	• Construct access in accordance with this work instruction • Perform routine inspections of the condition of the access tracks • Perform maintenance and refurbishment works • Consider access track conditions when performing project work

2. Requirements

As per ASM-FRA-A2358094, the high level objective of transmission line physical access is to provide dry weather 1 tonne 4WD ground access to the majority of structures (i.e. >97%).

In their initial construction, transmission line access tracks should make the least possible damage to the ground surface and should then be allowed to return to a grass covered state if practicable. Track forming, cutting, filling and installing pipes for drainage should be kept to a minimum. The location of the access tracks should be recorded using differential GPS equipment and loaded into spatial systems.

In maintenance, disturbance of the topsoil by a grader blade or other similar mechanical means should be kept to an absolute minimum and avoided wherever possible. Alterations to access established during construction should be minimised with appropriate governance checks performed prior to work being performed. Changes in access should be recorded using differential GPS equipment and loaded into spatial systems. Old access tracks should be left in a stable condition consistent with the surrounding land use.

Joint use of access tracks should be considered with formal agreements established and documented.

2.1 No Ground Access

Powerlink accepts that in extreme circumstances, no ground access may be possible after construction. These locations need to be recorded in corporate systems and should represent <1% of the total asset population.

2.2 Pedestrian Access

Powerlink accepts that in unusual circumstances, pedestrian ground access may be required after construction. These locations need to be recorded in corporate systems and should represent <2% of the total asset population.

2.3 Dry Weather 4WD Access

The vast majority of transmission line assets should have dry weather 4WD access standards as a minimum. If tracks are designed and constructed correctly, minimal maintenance should be required for the light traffic movements expected from Powerlink's maintenance activities.

If use of the access tracks increases in frequency or intensity (e.g. insulator replacement refurbishment) then additional costs to repair the tracks should be allocated to the relevant project.

If the use of the tracks from other users is causing an issue (e.g. recreational 4WD users) then the matter should be raised as a potential unauthorised co-use issue to be investigated.

2.3.1 Track Location

Initial track locations shall be determined by Powerlink's Representative in consultation with the landholder.

Existing tracks should be used where possible. Powerlink's Representative must be contacted if there are good reasons to deviate from the existing tracks. Approval in writing must be obtained from Powerlink's Representative before any deviation work proceeds.

Any bypassed section of track is to be subject to restoration work to ensure it is stable and consistent with surrounding land use. The scope of work required will be determined by Powerlink's Representative. Advice from support staff (e.g. safety, environment and cultural heritage) may be required.

2.3.2 Track Surfaces

Grassed surfaces should be considered as the preferred option if no erosion or drainage problems are evident. A well grassed running surface is considered ideal to achieve the best long term cost effective and environmentally responsible outcome.

A compressed earth running surface using blading is to be kept to a minimum on existing formed tracks and on track locations not requiring formation. In these situations, blading should only be performed to remove potential hazards (e.g. fallen limbs, stakes, rocks, etc.) or to repair potential damage to the running surface (e.g. wheel ruts).

Gravel, rock, bitumen and concrete may be required in isolated circumstances where the running surface has concentrated water flows that can't be diverted. This may also be required during the construction phase to enable accelerated construction programs. Where these investments have been made, they should be retained for the maintenance phase in consultation with the landholder.

2.3.3 Track Formation

Formed tracks may be deemed necessary for one or more of the following reasons:

1. Drainage control, especially in areas where any wheel rutting or compaction is likely to intercept, concentrate and channel water.
2. Where the topography of the track location or where the drainage characteristics of the soil are likely to hinder access for a protracted time period following rain.
3. Where natural side-slope would pose a safety hazard to potential users of the track.
4. Track formation can reduce or eliminate the need for patch gravelling however where gravelling is still considered to be warranted, the formation process can remove undesirable material and / or box the imported material where it is required.

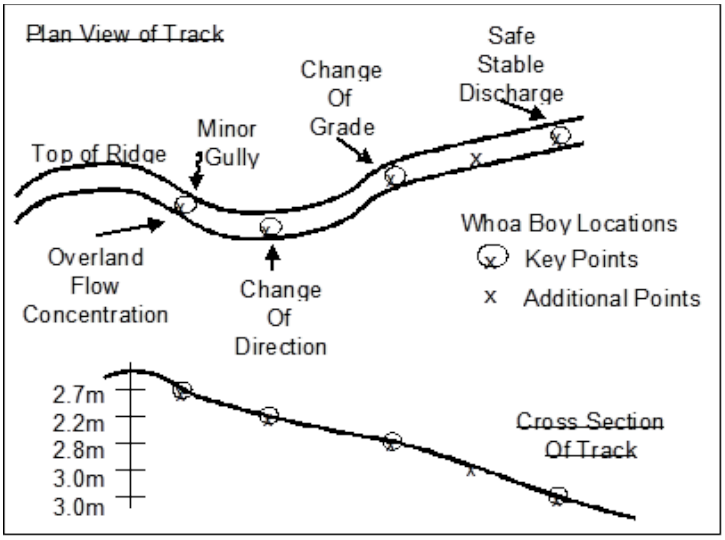
   The normal formation width (including batters, table-drains and running surface) should be 3 metres with clearing extended by 1 metre either side of the formation width to ensure vegetation does not obstruct vehicle movements. On steep topography, especially in areas of long lengths of side cut, hand felling may be required for clearing outside the formation widths. Clearing may also be extended to remove unsafe or unsound trees. Long batter lengths may require limited additional formation and clearing widths to allow for cross drainage.

2.3.4 Track Drainage

Where tracks have been formed, drainage considerations are critical to establish stable and cost effective tracks. Figure 2-1 illustrates how different applications may be applied to sections of an access track. The most appropriate solutions should consider the following:

- Soil types
- Rainfall
- Slope gradient, direction and length
- Overland flow and concentration points
- Safe/stable discharge points for any cross drainage

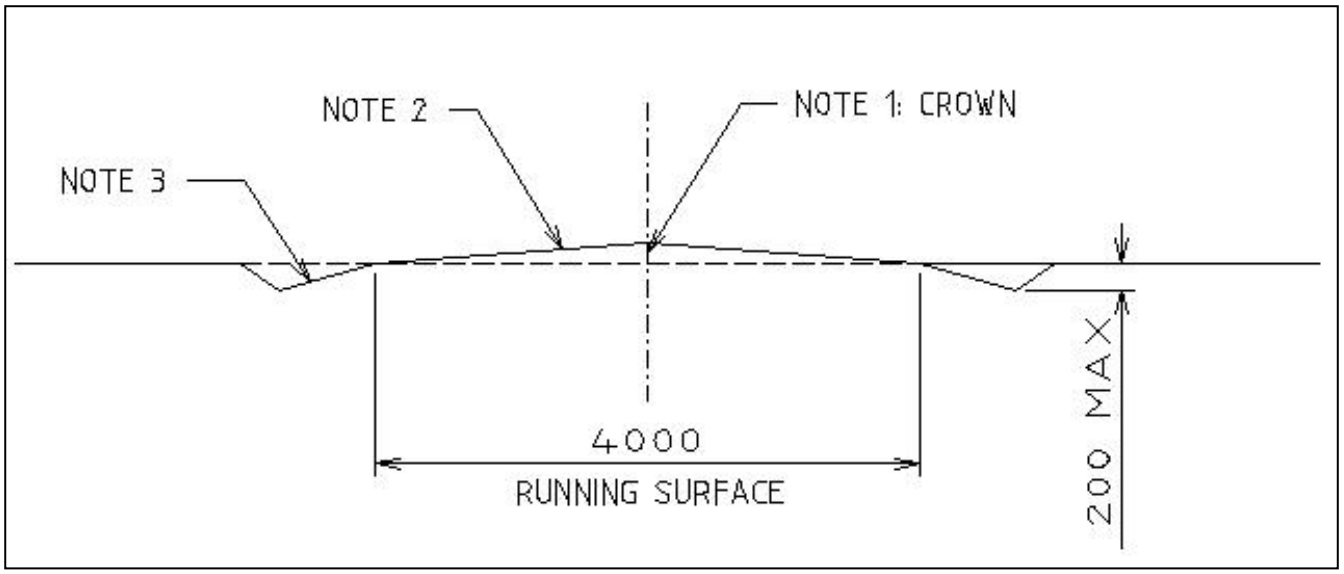
Figure 2-1 – Plan Track View for Stable Access Track Drainage



2.3.4.1 Crowned Surfaces

Crowned surfaces (as shown in Figure 2-2) are suitable for tracks where water can be shed from both sides of the formation. Crowned side-cut surfaces (as shown in Figure 2-3) are suitable for tracks where water can only be shed from one sides of the formation. This method may be used in other situations in conjunction with suitable cross road drainage techniques and may also require whoa boys to be installed for the dispersal of water confined or concentrated on the running surface of the track.

Figure 2-2 – Crowned Surface

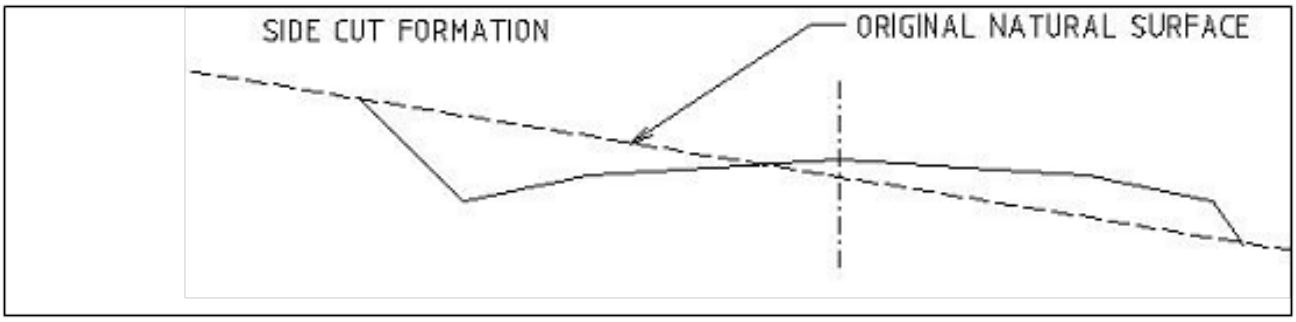


Note (1) *Normally 0.1m above natural surface after consolidation i.e. ≈ 0.15 unconsolidated*

Note (2) *Nominal design crossfall of 5% after consolidation i.e. ≈ 7% unconsolidated*

Note (3) *Nominal shoulder batter of 1:5 (20%)*

Figure 2-3 – Crowned Side-cut Surface

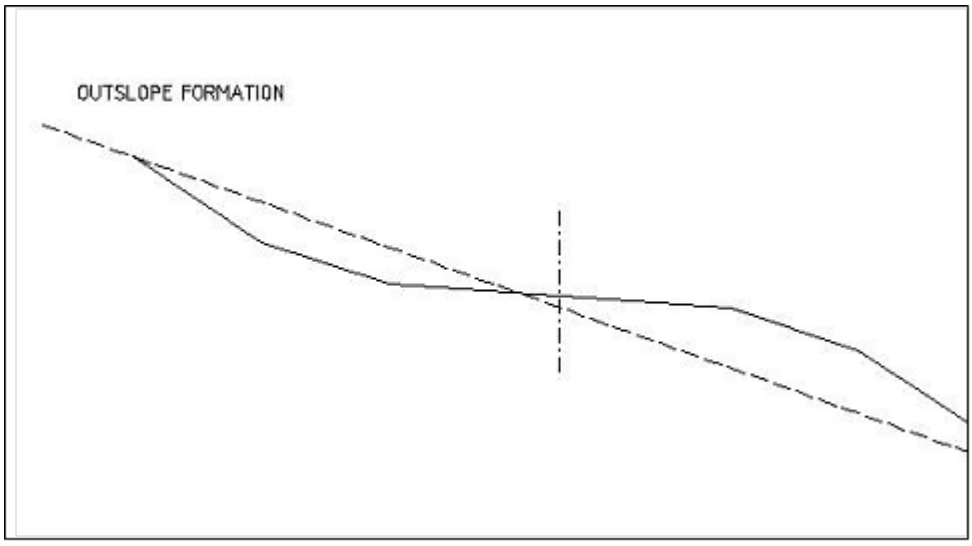


2.3.4.2 Out-slope Surface

Out-slope surfaces (see Figure 2-4) may be suitable for longer length side cuts where water can't be shed from the confined shoulder. The formation of the out-slope should include the following nominal design considerations:

- Normally 0.1m above natural surface after consolidation i.e. ≈ 0.15m unconsolidated
- Nominal design crossfall of 5% after consolidation i.e. ≈ 7% unconsolidated
- Nominal shoulder batter of 1:5 (20%)

Figure 2-4 – Out slope Surface

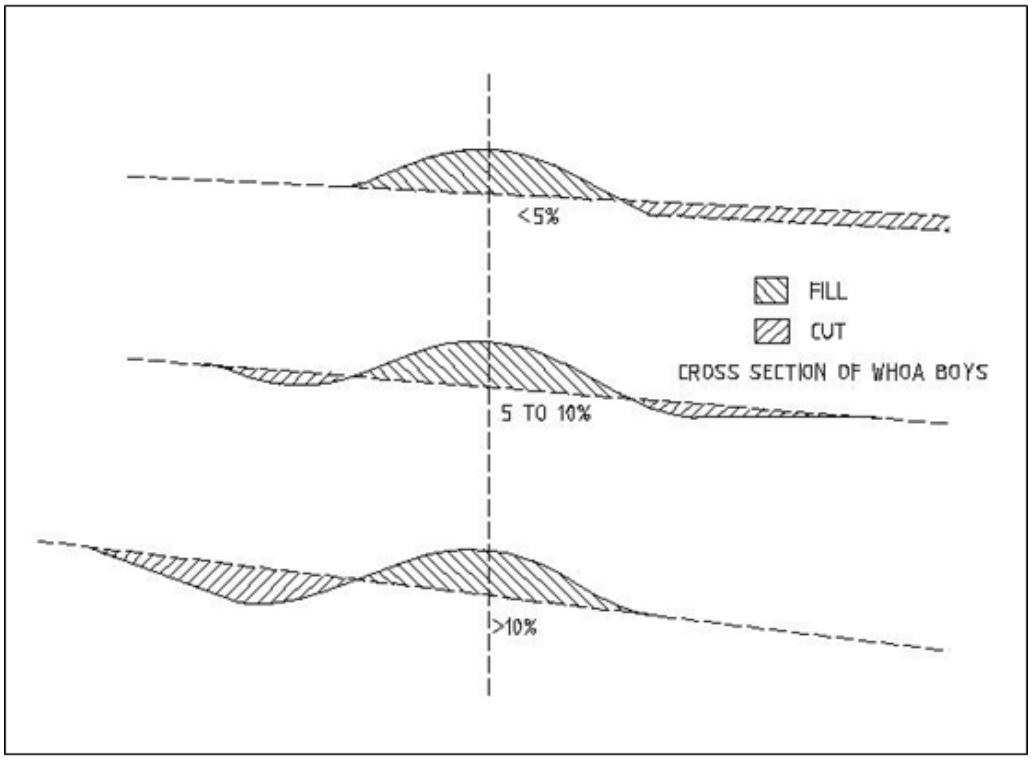


2.3.4.3 Whoa Boys and Turn Out Drains

Water flow should be intercepted and dispersed from table drains at safe locations at least every 3 metres of vertical fall of the track centre line. It is acknowledged that soil type, slope and climatic zones may vary the ideal from this requirement; any variation must be authorised in writing by Powerlink's Representative.

Whoa Boys must be easily trafficable and must drain water across the road without scouring, ponding or overtopping. They should be ≈ 0.6m high (unconsolidated) and be battered for a minimum of 2 metres on both top & bottom sides of the mound.

Figure 2-5 – Whoa Boy Formations



As per Figure 2-5, the following general principles apply when forming whoa boys:

- For slopes <5%, materials should be sourced from the lower side of the mound.
- For slopes 5% to 10%, materials should be sourced from both sides of the mound.
- For slopes >10%, all material should be sourced from above the mound.

In some very steep situations additional material may be required (e.g. gravel sourced externally).

Turn out drains generally:

1. Should be as short as possible.
2. Should be terminated in as wide (level) a discharge as is practical.
3. Should run at approximate 1.5% grade (the lead out of the table drain may exceed this limit but must not be more than 1.5 metre in length.
4. Must have an effective table drain stop.
5. Should extend as far as is required to prevent discharged water from flowing back to the road further down the slope.
6. Must discharge onto stable areas of undisturbed vegetation and not onto fill slopes, exposed soils or directly into a water course.

2.3.4.4 Diversion Drains

Diversion drains may need to be constructed to:

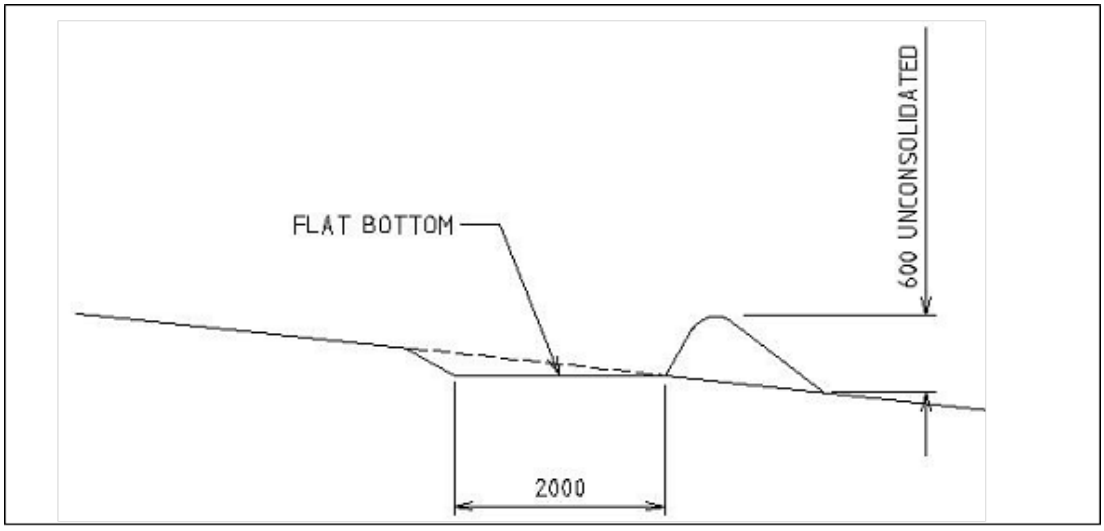
1. Intercept a major concentration of overland water flow.
2. Prevent road discharge water from flowing back onto the formation.

As illustrated in Figure 2-6, diversion drains should:

1. Be constructed with a grader.
2. Be flat bottomed ≈ 2 metres wide.
3. Capture no more than 2Ha of catchment.
4. Run at 1.0% ± 0.5%

5. Discharge onto stable areas of undisturbed vegetation and not onto fill slopes, exposed soils, or directly into a water course.
6. Be surveyed (e.g. using dumpy level and staff) prior to construction.
7. May need to be seeded with approved and appropriate grass species (e.g. Jap millet, oats, couch, natives) as specified by Powerlink's Representative.
8. Have batters of less than 1:1.5.
9. Have an unconsolidated mound height of 600 mm.

Figure 2-6 – Diversion Drain Formation



2.4 Emergency Ground Access

In situations where access to difficult sites is required under adverse weather conditions (e.g. emergency circumstances), it may be necessary to construct access away from the easement. Under sections 140A and 140B of the Electricity Act 1994, Powerlink is bound to make good all damage caused by such entry. Governance checks should be made with the appropriate support staff to provide the best advice possible given the circumstances (e.g. safety, environment and cultural heritage).

2.5 Washdowns and Other Site Entry Conditions

Joint management of matters is essential for successful management of land assets, particularly when it comes to biosecurity matters.

As part of Powerlink's response, Powerlink has installed washdown facilities and inspection points in strategic locations in accordance with the Biosecurity Procedure. Vehicle washdowns or hygiene inspections could be a requirement prior to entering a property or zone.

Other site entry conditions or constraints could also apply, which should be recorded in corporate systems. Contact your safety and environment advisor for advice, particularly if soil disturbance or movement is involved.

2.6 Signage, Gates & Fences

Signage for direction (e.g. finger boards) to transmission line structures should be maintained to assist ground access along transmission lines. Where signage was not installed at the time of construction, installation of signage will be considered as a possible refurbishment project and must be raised with the Land Strategist.

Signage indicating restrictions on access may also have been installed at the time of construction. Their need in the maintenance phase should be discussed with the relevant landholder(s).

During line construction, fences may need to be cut and gates erected (and sometimes locked). The integrity of these gates and fences, as altered by Powerlink-authorised construction work, or damaged by subsequent authorised access, must be maintained at all times.

If a new subdivision creates fences across access tracks, or a landowner wishes to erect an internal fence across an access track which will prevent access to a structure, a gate must be erected in the fence for Powerlink use. The minimum requirement would be to request the person constructing the fence to include a gate in their planned fence-line, with the gate being supplied free of charge by Powerlink Queensland.

All line access gates installed in boundary fences should be locked with standard Powerlink transmission line locks, unless adjacent property owners are satisfied that they be left unlocked. Gates installed in internal property fences will be latched or locked on request. Powerlink locks remain the property of Powerlink, and should only be used to give authorised personnel access through a gate. Any extra lock/s are to be located so that no party can lock any other party out.

Gates are to be left as they are found. Where it appears that a gate should be shut, the relevant landholder should be contacted if possible, to ascertain the appropriate action.

2.7 Water Crossings

Water courses crossings are significant features in the landscape and various regulations have been designed to protect their values for the broader community.

Typically and preferably, Powerlink will install bed level crossings, but in certain circumstances, culverts and bridges may be installed. These will require difference levels of advice, which is outlined below:

- Bed level crossings (self-assessable codes apply, safety and environment advice may be required)
- Culverts (engineering advice is required, including an assessment of the expected flow rates based on an assessment of the catchment area)
- Bridges (significant engineering advice is required, including structural assessments and design evaluations)

2.8 Surrounding Landuse

Access tracks need to consider the surrounding land use and link in with existing access where feasible. Changes in land use that restrict access need to be recorded and reported through corporate systems.

2.9 Safety & Environment

Staying on designated access will ensure safety and environment matters are minimised. When establishing new access tracks or deviating the alignment of an existing access track, advice from safety and environment advisors will be required.

3. Distribution list

Divisional Distribution	Contact details
Chief Executive	N/A
Delivery and Technical Solutions	Group Manager Infrastructure Delivery – Non-Regulated Group Manager Infrastructure Delivery – Regulated Group Manager Design Solutions Group Manager Community and Delivery Services
Energy Futures	N/A
Finance and Governance	N/A
Network and Business Development	Group Manager Asset Strategy and Planning Manager Asset Strategies Team Leader Lines Strategies Senior Strategist for Land Assets and Research Development
Operations and Service Delivery	Group Manager Service and Supply Partners Group Manager Field Delivery Group Manager Technical and Network Solutions
People and Corporate Services	N/A
Group/Team Distribution	**Contact details**
N/A	N/A
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Energy Australia	Ergon Document Controller