Engineering Procedure
Electrical Distribution Unit

PR D 78702

Procedure for the Stringing of 1500V OHW Conductors in the Vicinity of Existing Electrical Equipment

Version 1.1

Date in Force: 26 February 2019

Procedure

Transport Sydney Trains

NSW GOVERNMENT

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Version	Date	Author/ Prin. Eng.	Summary of change
1.0	20 January 2016	Chris Leung	First issue as a Sydney Trains document, rebranded from previous RailCorp SMS-06-GD-1588 V1.0
1.1	26 February 2019	Chris Leung	Update references, roles and position names to reflect the current organisation

Summary of changes from previous version

Summary of change	**Section**

Table of Contents

1. Purpose

To provide information about the hazards, controls and the safety requirements to be complied with specifically associated with the stringing of 1500V OHW conductors in the vicinity of existing electrical equipment.

1.1 Regarding existing RailCorp electrical equipment

Generally, all work in the vicinity of existing RailCorp electrical equipment shall be planned and carried out to ensure that the SAD's described in Tables 1 and 2 of Section 11 of procedure SMS-06-GD-0268 Working around Electrical Equipment are complied with. However, this procedure requires greater minimum SAD's for activities associated with 1500V OHW conductor stringing in the vicinity of existing RailCorp electrical equipment as the risks associated with 1500V OHW conductor stringing are such that the SAD's of Tables 1 and 2 of procedure SMS-06-GD-0268 are in-appropriate.

1.2 Regarding existing electrical equipment owned by another Network Operator

The same requirements as described above for existing RailCorp electrical equipment apply. In addition, the Network Operator concerned shall also be requested to advise controls necessary for the work and these shall be complied with provided such controls are not lesser requirements than that which are required if the existing service was owned by RailCorp. For example, the Network Operator may require greater SAD's for the 1500V conductor stringing work than those required by Sydney Trains.

2. Scope

This document is applicable to all persons stringing 1500V OHW conductors in the vicinity of existing electrical equipment and deals only with the risks associated with performing the stringing work in the vicinity of this existing electrical equipment. The 1500V OHW conductor stringing work includes both RailCorp and non-RailCorp owned 1500V OHW conductors being strung in the vicinity of the existing electrical equipment and the provisions of this procedure apply whether or not the work is being performed on or over RailCorp land.

This procedure does not apply to the stringing of 1500V OHW conductors in the vicinity of existing electrical equipment where the existing electrical equipment operates at a voltage exceeding 132kV. Guidance on this matter shall be sought from Associate Director Electrical Distribution Unit.

This procedure does not apply to the use of mobile plant involved in the stringing of 1500V OHW conductors in the vicinity of existing electrical equipment. For guidance on this matter, refer to procedure SMS-06-GD-0268 Working around Electrical Equipment - Appendix A - Safe use of mobile plant around Electrical Equipment."

This procedure does not apply to the erection of poles or structures associated with the 1500V OHW stringing. For guidance on this matter, refer to procedure SMS-06-GD-0268 Working around Electrical Equipment.

This procedure does not apply to the erection of 1500V OHW hardware either temporarily installed for stringing purposes or permanently installed in readiness to support the conductors in their design position after stringing. For guidance on this matter, refer to procedure SMS-06-GD-0268 Working around Electrical Equipment.

This procedure does not cover the requirements to be met when working around running rail lines. The Sydney Trains Network Rules and Procedures shall be complied with in this regard.

This procedure is based on

- the design feature employed in current electric rolling stock approved for use on RailCorp's 1500V OHW system which ensures that the energisation of any pantograph on a particular train at 1500V can only be achieved through contact with the 1500V OHW and not from one pantograph to another via the trains internal electrical system and
- that the risk of failure of this design feature on a particular train, immediately prior to or simultaneously with the pantographs of that train bridging the separation between live 1500V OHW and OHW being strung, can be considered to meet ALARP requirements.

3. Statutory requirements

Work on or near or in the vicinity of electrical equipment shall be carried out in accordance with

- The NSW Electricity Supply Act 1995 and Electricity Supply (Safety and Network Management) Regulation 2014
- The NSW Rail Safety National Law 2012, and
- The NSW Work Health and Safety Act 2011 and the associated NSW Work Health and Safety Regulation 2017

4. Definitions

Refer to PR D 78100 Definitions and Conventions for Electrical Safety for:

Induction, Stringing, Work In the Vicinity of, Safe Approach Distance (SAD), and Safe Work Method Statements (SWMS).

5. Planning for 1500V OHW conductor stringing in the vicinity of existing electrical equipment

Prior to commencement of 1500V OHW conductor stringing in the vicinity of existing electrical equipment being performed, planning for this work shall be carried out by the person requiring this work to be performed.

This planning shall be done in consultation with the persons who will actually be doing the work and shall include :–

An identification of the foreseeable hazards involved in stringing the new 1500V OHW conductors around the existing electrical equipment (see 5.1),

and

An assessment of the risks (see 5.2)

and

Understanding and planning to implement the relevant requirements necessary to eliminate or control the risks (see 5.3)

5.1 Identification of the foreseeable hazards involved in stringing 1500V OHW conductors in the vicinity of existing electrical equipment

Existing exposed aerial lines and associated electrical equipment are a potential hazard posing a substantial risk of death or serious injury to persons stringing 1500V OHW conductors.

An existing aerial line and associated electrical equipment maintained by Sydney Trains shall be treated as **live** by a person unless that person has signed onto an Electrical Permit covering that aerial line and covering the work being performed by that person during the time for which that permit is current. See procedure SMS-06-GD-0268 Working around Electrical Equipment.

An existing aerial line and associated electrical equipment owned or maintained by another Network Operator shall be treated as **live** by a person unless that person has been advised in writing by the Network Operator concerned and has complied with any requirements imposed by that Network Operator.

5.1.1 Direct Contact or near (arcing) contact

Direct Contact or near (arcing) contact between :–

EITHER

the 1500V OHW conductor being strung,

or

mobile plant and machinery being used to string the 1500V OHW conductor,

or

persons stringing the 1500V conductors

AND existing live electrical equipment can result in :–

- Electrical shock and electrocution
- A rain of molten metal
- Fire
- Explosion
- Swift, unpredictable aerial line conductor whip-lash
- Loss of electrical power supply to the rail network, which may have major implications for rail safety

It is important to remember that these risks can arise not only through direct contact with the existing electrical equipment but also by arcing from close approach to the existing electrical equipment.

5.1.2 Electromagnetic Induction

Hazardous voltages due to nearby existing in-service electrical equipment can occur on 1500V OHW being strung through electromagnetic induction ie without either direct contact or arcing contact having been made.

Electromagnetic Induction can be a problem for persons stringing 1500V OHW conductors when this OHW has an in-service aerial line running parallel and relatively close to it for some part of its length. The voltage induced in the 1500V OHW being strung increases with :

a) an increase in current in the nearby in-service aerial line. Lightning strikes and switching surges on the existing in-service line are of particular concern in this regard. Fault current flowing through the in-service line may result in induced voltages many times larger than would result from load current flowing in the in-service aerial line

b) closeness of the in-service aerial line to the 1500V OHW being strung

c) the length the existing in-service aerial line runs parallel to the 1500V OHW being strung

The closer the lines and the longer the distance the lines run parallel and the larger the current flowing in the existing in-service aerial line, the greater the induced voltage in the 1500V OHW being strung. Where closed electrical circuits exist in the 1500V OHW being strung due to, for example, connections to earth, induced voltages will result in induced current flows. If the flow of this induced current is interrupted, an induced voltage will appear across the break in the circuit.

5.1.3 Electrostatic Induction

Conductors of in-service electrical equipment have equipotential circular rings of electrical field surrounding them. If a conductor of the 1500V OHW being strung is situated within such an electric field, then an electric charge will build up on that conductor. Electrostatic Induction is the build up of electric charge on a conductor (such as the conductors of 1500V OHW or the persons and equipment stringing the 1500V OHW conductors) which is situated in the electric field of a nearby live aerial line. The amount of charge build up increases with

a) the magnitude of the voltage on the existing in-service electrical equipment

b) a reduction in the distance between the existing in-service electrical equipment and the 1500V OHW being strung

c) the length of the 1500V OHW being strung that resides within the electric field of the in-service electrical equipment

A person stringing a 1500V OHW conductor who is under the influence of such an electric field will undergo electrostatic induction. If that person is continually in contact with earth, the charge will continuously flow (drain) to earth without perception and not build up. If however that person is insulated from earth (eg by rubber boots) the charge will build up. If that person then touches an earthed conductor (or any earthed object), a perceptible and often annoying discharge (flow of electric current to earth) will occur. This discharge may be similar to the shock received after walking across a carpet and then touching a door knob. Whilst painful, the lack of significant current flow makes these discharges not harmful in themselves. However, the danger to persons experiencing them whilst stringing 1500V OHW conductors is the fact that they can surprise someone not expecting them at a critical time and cause loss of balance.

5.2 Assessment of the risks involved in stringing 1500V OHW conductors in the vicinity of existing electrical equipment

Risk factors which shall be considered include, but are not limited to the following:-

a) the voltage of an existing nearby aerial line and/or the associated electrical equipment.
If the voltage of the aerial line and associated equipment is not known and cannot be definitely determined, then the Electrical Engineer in the Sydney Trains District concerned is to be contacted to obtain accurate information.

b) the horizontal distance between the 1500V OHW conductors being strung and an existing aerial line and associated electrical equipment. See Clause A.4.2.1 b) of SMS-06-GD-0268 Working around Electrical Equipment for further information relevant to this matter.

c) The vertical height difference between the 1500V OHW conductors being strung and the existing electrical equipment whether caused by terrain or by difference in design height. See Clause A.4.2.1 b) of SMS-06-GD-0268 Working around Electrical Equipment for further information relevant to this matter.

d) the tasks to be undertaken in order to string the 1500V OHW conductors. This also includes a consideration of the tools and equipment and methods to be used.

e) the qualifications, competency, skill, experience and currency of the people doing the work.

f) the number of people involved in the work

g) the length of the 1500V OHW conductor stringing work and whether or not

- parts of conductors being strung will be out of view for periods of time, or
- persons involved will be so distributed that radio / mobile phones will be needed to maintain necessary communication

h) prevailing or unexpected wind strength and direction which may impact on the distance between the 1500V OHW conductors being strung and the existing aerial line and associated electrical equipment. See Clause A.4.2.1 b) of SMS-06-GD-0268 Working around Electrical Equipment for further information relevant to this matter.

i) rail and vehicular traffic, pedestrians or livestock that could interfere with or be impacted by the 1500V OHW conductor stringing work

j) foreseeable conditions that may exist at the worksite, including but not limited to

- weather conditions – the effects of wind gusts on the conductors being strung
- lighting conditions – low light levels, glare or mist/fog which may impede clear viewing of the 1500V OHW conductor stringing operation

k) the curvature of the route of the 1500V OHW being strung. Small radius curves will result in higher radial loads and a tendency for the 1500V OHW conductors to move towards the centre of the curve unless adequately restrained

l) the duration of the work in the vicinity of existing electrical equipment involving the stringing of the 1500V OHW conductors. People involved with tasks that are to be carried out over protracted periods of time may initially be alert to risks and vigilant to ensure appropriate controls are applied. However, these same people can become complacent as time passes and work is successfully progressing.

m) the distance between structures supporting the 1500V OHW conductors being strung. The longer this distance, the greater the risk of uncontrolled movement of the conductor whilst being erected and in the event that this conductor breaks or is "let go" by the equipment being used to erect it.

n) the tension under which the 1500V OHW conductor is being strung. Higher tensions will normally result in larger horizontal deflections of conductor in the event of breakage whilst stringing. Lower tensions could result in larger conductor sags and possible consequent clearance problems to ground and ground mounted objects. Note the characteristic of both 193mm2 and 137mm2 contact wire which, due to the tendency of this conductor to resume the tightly coiled position it originally occupied when new on the cable drum, results in unpredictable conductor movement during loss of control events, even when such conductor is being strung at low tension.

o) the correct functioning of the equipment and tools to be used in the stringing of the 1500V OHW conductors and the correct handling of cable drums to ensure that a turn of conductor being unwound from a drum does not lock under an adjacent turn

p) the rate/speed at which the conductor stringing is performed

q) the presence of existing aerial lines above the 1500V OHW conductors being strung.

r) the presence of existing electrical equipment supported on the same structures as supporting the 1500V OHW conductors being strung.

s) the existence or otherwise of physical barriers (eg tunnels, Station Buildings) between the 1500V OHW conductors being strung and an existing aerial line and associated electrical equipment. Such a physical barrier may be able to be considered as suitable to prevent encroachment onto an existing OHW section by OHW conductors being strung.

t) the existence of 1500V OHW sectioning switches for the inner tracks at locations employing 4 or 6 track portal structures. These sectioning switches are generally located on the masts of those portal structures

u) the stringing of 1500V OHW in the vicinity of existing electrical equipment owned by another Network Operator. In such a case, other risk factors nominated by that Network Operator shall be considered.

5.3 Requesting information from the Sydney Trains Electrical Engineer for the District concerned

Where the planning risk assessment identifies that the Sydney Trains Electrical Engineer shall be requested to provide information such as, but not limited to the voltage, height, or horizontal safety clearances to existing RailCorp electrical equipment, this request shall be made in writing.

Where such a request for information is made, no work shall commence until a written response has been received from the Sydney Trains Electrical Engineer of the District concerned.

Upon receiving a written request for information, the Sydney Trains Electrical Engineer shall ensure that an Authorised Person inspects the proposed work location with the person requesting the information, and understands the work that is being planned.

The Sydney Trains Electrical Engineer shall then respond to the request in writing, providing all of the requested information and other advice considered relevant to the proposed work. This written advice shall remind the requestor that the requirements of procedure PR D 78702 Procedure for the stringing of 1500V OHW conductors in the vicinity of existing electrical equipment shall be complied with.

5.4 Requirements to eliminate or control the risks of stringing 1500V OHW conductors in the vicinity of existing electrical equipment

5.4.1 General

All OHW construction staff shall be suitably authorised in accordance with PR D 78701 Personnel Certifications – Electrical.

Prior to commencing any work on the stringing of 1500V OHW conductors, the persons involved shall comply with their employer's Safe Work Method Statements (SWMS) concerning 1500V OHW conductor stringing. Should a conflict exist between any requirement of that documentation and this procedure, then the matter shall be resolved prior to work commencing.

All 1500V OHW conductor stringing work in the vicinity of existing electrical equipment shall be carried out in accordance with the requirements of procedure SMS-06-GD-0268 Working around Electrical Equipment and procedure PR D 78701 Personnel Certifications – Electrical.

No 1500V OHW conductor stringing work is permitted to be performed on structures that have not been appropriately labelled as per the numbering shown on the design layout. Structures nominated as the limits of an electrically safe work area on an Electrical Permit to Work shall have the correct final mast label plates installed prior to the issue of that Electrical Permit to Work.

No 1500V OHW conductor stringing work is permitted to be performed above exposed existing electrical equipment unless all persons performing this work have signed onto an Electrical Permit for this existing electrical equipment.

Irrespective of whether or not existing electrical equipment is in the vicinity, when pulling a 1500V OHW conductor through a series of stringing sheaves (Gin wheels) using a synthetic pilot draw cable and swivel connection, the progress of the swivel at each gin wheel is to be monitored by safety observers and radio contact between the safety observers and the controllers of the pulling unit and the brake unit is to be maintained. (See Diagram 1) See SMS-06-GD-0268 Working around Electrical Equipment – clause 5.3.5" for guidance on the roles and responsibilities of safety observers. In addition, the cable drum shall be mounted on the drum/brake unit in the configuration that ensures that the drum will be rolled in the direction that tends to tighten the turns of the conductor on the drum. This reduces the risk of underlaying of turns due to unwinding of conductor on the cable drum.

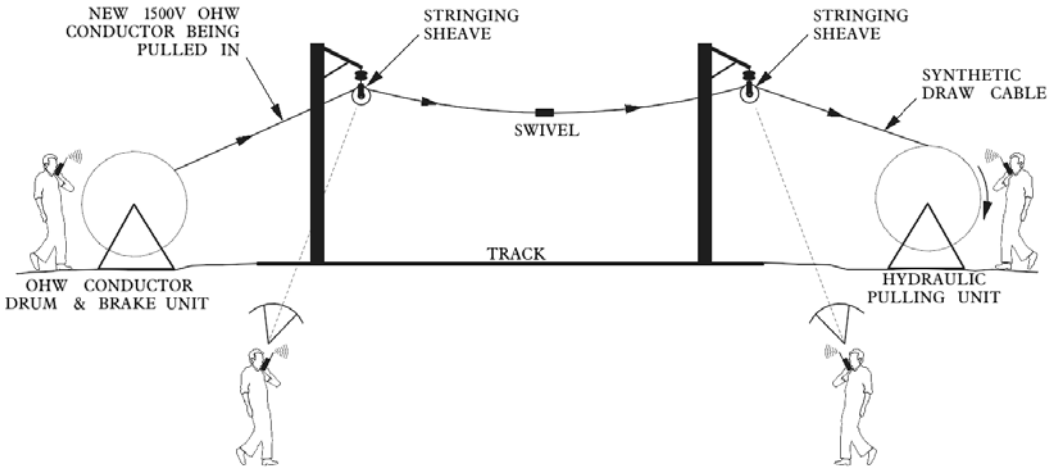

Diagram 1

Consideration shall also be given as to whether temporary back anchors are to be installed on the structures which may bear temporary out of balance loads or overloads as a result of the 1500V OHW conductor stringing work. Designers should provide construction support documentation for the loading of structures and temporary staying requirements, particularly for pre-tensioning of conductors.

All equipment being used to perform the stringing shall comply with the latest Australian Standard relevant to that equipment, appropriately load rated to string the conductor concerned at the stringing tension to be used and maintained in serviceable condition.

5.4.2 Requirements for stringing 1500V OHW conductors in the vicinity of existing electrified tracks

Where the OHW stringing is to be performed within 10m horizontal distance of live exposed 1500V OHW, then all persons performing the stringing work shall be signed onto an Electrical Permit to Work for the live exposed OHW concerned. (See Diagram 2.)

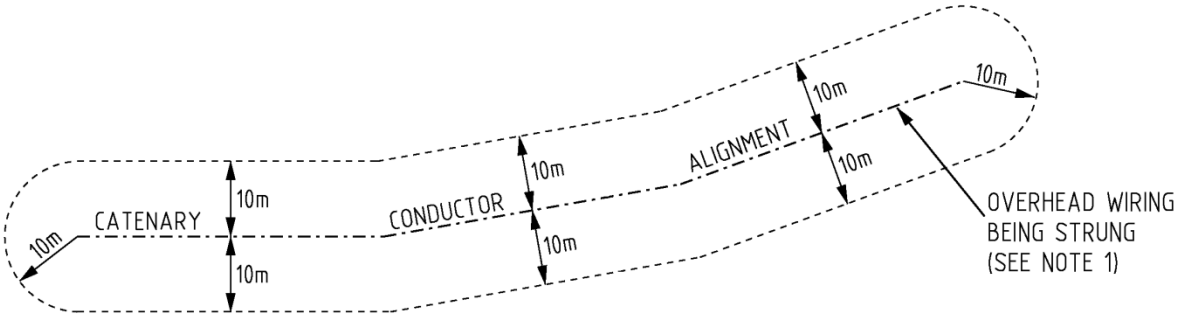

Diagram 2

NOTE 1: *the 10m horizontal distances are with respect to the alignment of the Catenary conductor.*

If it is not reasonably practical to obtain an Electrical Permit at a particular location (see procedure SMS-06-GD-0268 Working around Electrical Equipment - Appendix A – AN.2.2") approval may be given by the Associate Director Electrical Distribution Unit for a reduction in the SADs of Diagram 2 at a particular site on the basis of site specific controls to be applied at that location. These site specific controls shall be covered by the SWMS applicable to the work and evidence that all the staff undertaking the work have been trained and assessed in these SWMS shall be provided .

Such site specific controls may include:

a) The use of a process that has been verified as capable of preventing the conductor being strung deviating sideways in the event of a situation developing which results in a sudden and uncontrolled loss of tension in that conductor.

b) The stringing of all conductors in slack tension.

c) The uncoiling of a coil of the conductor in slack tension along the ground and then lifting the conductor into its final aerial position.

NOTE: *Conductors being strung shall not be dragged along the ground as this will result in damage to the outer strands leading to weakening of the conductor and eventual failure*

When employing the commonly used OHW stringing method as illustrated in Diagram 3, a safety observer shall be located at the temporary chainblock / comealong anchor connection to monitor the integrity of this connection whilst the conductor concerned is being strung until the final anchor arrangement is installed. Radio communication between the operators of each of the track vehicles concerned and the temporary termination safety observer shall be maintained for the duration of this conductor stringing operation. This shall be done irrespective of whether or not existing electrical equipment is in the vicinity. See procedure SMS-06-GD-0268 Working around Electrical Equipment – clause 5.3.5 for guidance on the roles and responsibilities of safety observers.

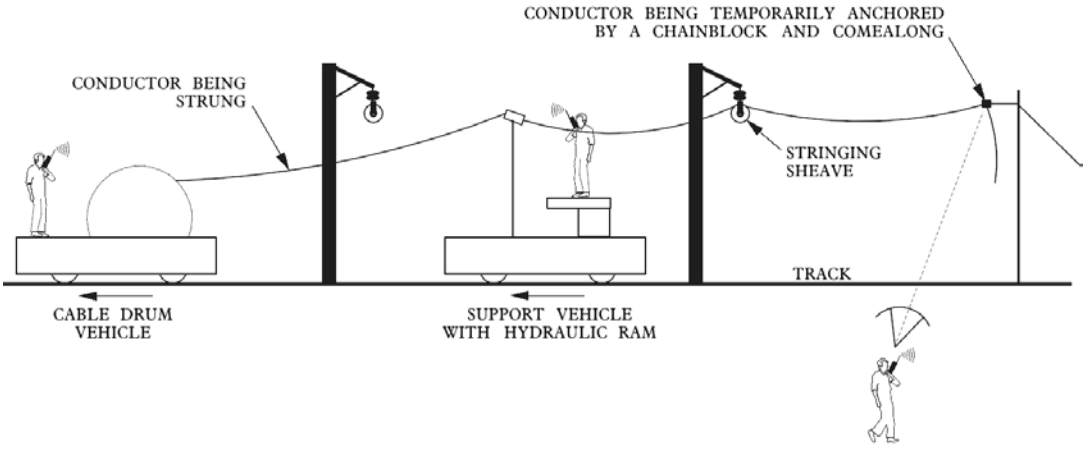

Diagram 3

5.4.3 Existence of Barriers between tracks

Where continuous barriers exist (eg tunnel walls, station buildings) which are

- capable of resisting the forces that might be imposed from the impact due to loss of control over a conductor being strung, and
- capable of preventing the conductors being strung from encroaching on the SAD's of Tables 1 and 2 of procedure SMS-06-GD-0268 Working around Electrical Equipment of existing exposed electrical equipment in the event of loss of control over a conductor being strung

then the 10 metre requirements of 5.4.2 do not apply.

When this is the case, the barrier and the SWMS for the work are to be approved by

- a competent person who understands sufficient detail of the structural limitations of the proposed barrier as to be able to assess its adequacy to resist the forces that might be imposed from the impact due to loss of control over a conductor being strung, and
- an Authorised Officer (Mains) who understands sufficient detail of the work process for which the barrier is required as to be able to assess the barrier's adequacy to prevent the conductors being strung from encroaching on the SAD's of Tables 1 and 2 of procedure SMS-06-GD-0268 of existing exposed electrical equipment in the event of loss of control over a conductor being strung.

5.4.4 Requirements for stringing 1500V OHW conductors in the vicinity of existing HV / LV exposed electrical equipment

No 1500V OHW conductor stringing work is to be carried out in the vicinity of existing exposed HV /LV electrical equipment that exists within the dotted area as indicated in Diagram 4 unless the persons performing the 1500V OHW conductor stringing work have signed onto an electrical permit for the exposed existing HV / LV electrical equipment concerned.

If it is not reasonably practical to obtain a permit (see procedure SMS-06-GD-0268 Working around Electrical Equipment – Appendix A – AN.2.2), approval may be given by the for a reduction of the SAD's of Diagram 4 at a particular site on the basis of site specific controls to be applied at that location. These site specific controls shall be covered by the SWMS applicable to the work and evidence that all the staff undertaking the work have been trained and assessed in these SWMS shall be provided.

Such site specific controls may include:

a) the use of a process that has been verified as capable of preventing the conductor being strung from deviating outside the dotted area of Diagram 4 in the event of a situation developing which results in a sudden and uncontrolled loss of tension in the conductor being strung.

b) the stringing of the conductor in slack tension.

c) the running out of the conductor in slack tension along the ground as turns of conductor from the drum are unwound and then lifting the conductor into it's final aerial position.

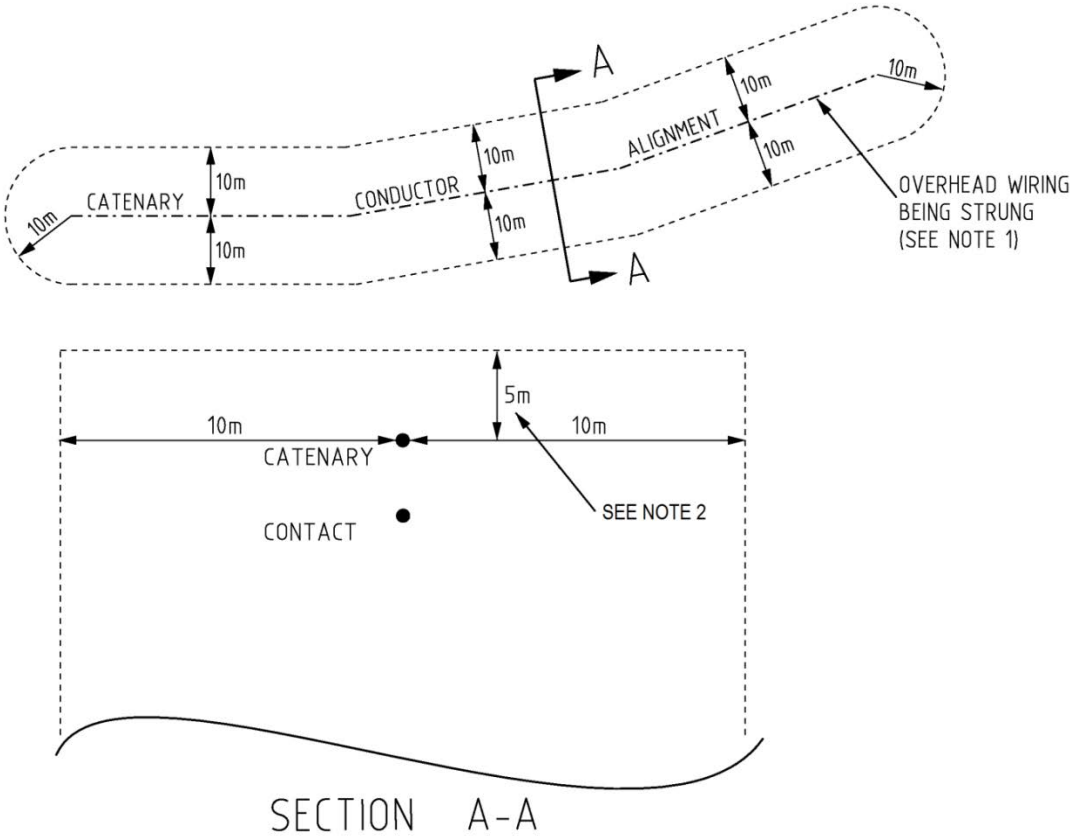
A
A
10m
10m
10m
10m
10m
10m
10m
CATENARY
CONDUCTOR
ALIGNMENT
OVERHEAD WIRING
BEING STRUNG
(SEE NOTE 1)
5m
10m
10m
CATENARY
CONTACT
SEE NOTE 2
SECTION A-A

Diagram 4

NOTE 1: *The 10m horizontal distances are measured from the alignment of the catenary conductor.*

NOTE 2: *If the stringing of the contact wire only is being performed and the associated catenary conductor above is rail connected or earthed, then the 5m vertical distance applies only to the contact wire.*

5.4.5 Requirements for stringing 1500V OHW conductors in the vicinity of existing exposed 1500V switches, feeder cables and associated surge arrestors

Often existing exposed 1500V switches, feeder cables and associated surge arrestors that are not associated with a particular track's OHW section / sub-section exist in the vicinity of or immediately above that track.

No 1500V OHW conductor stringing work on a track is to be carried out in the vicinity of such existing exposed 1500V equipment if such equipment exists within the dotted area as indicated in Diagram 4 unless the persons performing the work have signed onto an Electrical Permit for the existing exposed 1500V equipment concerned.

5.4.6 Requirements for Rail-Connecting or Earthing of 1500V OHW conductors being strung

As soon as practicable 1500V OHW conductors being strung over track which is bonded to traction rail and monitored by a commissioned Rail-Earth Contactor shall be connected to rail in accordance with Sections 8.2 and 8.3 of PR D 78305 1500 Volt Operating Procedures and these rail connections recorded on the Electrical Permit to Work

The Signals representative of the District concerned shall be consulted and nominate which rail/s that these connections shall be made to.

In this case, if off-track vehicle mounted cable drum / brake and winch vehicles are being used, then controls shall be put in place to ensure that only the vehicle operators come in contact with the vehicles and, if standing on the ground, LV insulating mats shall be provided for them to stand on.

If the track over which the OHW is being strung is not bonded to traction rail, then earthing of the OHW conductors being strung shall be carried out in lieu of rail connecting. The earthing shall be achieved using the same equipment as used for rail connecting except that the ground connections shall be established in accordance with Section 4.2.1 of PR D 78204 Earthing of High Voltage Equipment Using Portable Earthing Equipment.

If earthing of OHW being strung is carried out, then off track vehicle mounted cable drum / brake and winch vehicles being used for the stringing shall likewise be earthed.

6. References

AS 1418.1-2002	Cranes, hoists and winches – General requirements
AS 1418.2-1997	Cranes (including hoists and winches) – Serial hoists and winches
ISSC 20 2012	Guidelines for the Management of Electricity Easements
PR D 78204	Earthing of High Voltage Equipment Using Portable Earthing Equipment
PR D 78305	1500 Volt Operating Procedures
PR D 78701	Personnel Certifications – Electrical
SMS-06-GD-0268	Working around Electrical Equipment

7. Appendix

7.1 Horizontal 10m distance to existing HV/LV aerial lines derivation

Clause 5.4.4 requires a minimum 10m horizontal distance to existing HV/LV electrical equipment around a 1500V OHW conductor being strung without the need for an Electrical Permit to cover this existing electrical equipment for the duration of the conductor stringing. This distance is equivalent to the distance from the centreline of a traditional RailCorp high voltage easement (1 chain wide) to the edge of an adjacent high voltage easement. These easements have been established by RailCorp for many years in accordance with ISSC20 Guidelines for the Management of Electricity Easements primarily to allow appropriate management by Network Operators of access and safety aspects associated with the construction, operation and maintenance of electricity installations up to and including 132kV.

7.2 Vertical 5m distance to existing HV aerial lines derivation

Clause 5.4.4 requires a minimum 5m vertical separation between a 1500V OHW conductor being strung and an existing HV conductor above without the need for an Electrical Permit to cover this existing HV aerial line above for the duration of the conductor stringing.

The 5m distance is based on the required minimum height separation of 5m above in-service 1500V OHW and HV conductors crossing over the top – see T HR EL 10005 ST Requirements for Electric Aerials Crossing RailCorp Infrastructure - Clause 7.2.4. Heights.

7.3 Derivation of the 10m distance to existing live exposed 1500V equipment

Clause 5.4.2 requires that, where 1500V OHW exists on tracks adjacent to where it is proposed to string the OHW, then a 10m separation distance applies ie the OHW stringing cannot proceed unless all persons performing the work have signed onto an electrical permit for the existing 1500V OHW within 10m horizontally of the OHW being strung.

This 10m minimum separation has been derived from past experience and practice and is based both on

- The horizontal distance associated with a 2 track separation (typically 10m minimum), and
- The physical barrier provided by an adjacent track of rail-connected OHW equipment.