



Ausgrid

ASP/3 Seminar

4 December 2018

Asquith Leagues Club Waitara



Matthew Hindson

Contestable Connections Manager



Introduction

- Emergency exits and facilities.
- Mobile phones off/silent please.
- Questions and Answers:
 - **Only relevant to seminar topics today**
 - Clearly write down your questions including Topic, Question and your Name on pads provided
 - Hand questions to Ausgrid staff throughout the presentations, don't leave them all to the end
 - Answers will be provided during Q&A.
- Ausgrid staff in attendance.
- Feedback form.



Agenda

9:00am	1. Welcome	Matthew Hindson
9:05am	2. Updates and Reminders	Matthew Hindson
10:00am	3. Kiosk Substation Design and Construction Review	Darko Grcev Peter Turrin
10:15am	4. Better Connected Project	Wayne Armstrong
10:30am	BREAK	
10:45m	5. Customer Relationship Management (CRM) Project	Andrew Vandenberg
11:00am	6. Subtransmission Overhead Line Design	Jonathon Marriott
12:00pm	7. AutoCAD and Net CAD External Design Template	Max Labecki
12:15pm	Q & A	All
12:45pm	CLOSE	Matthew Hindson

Topics for discussion today

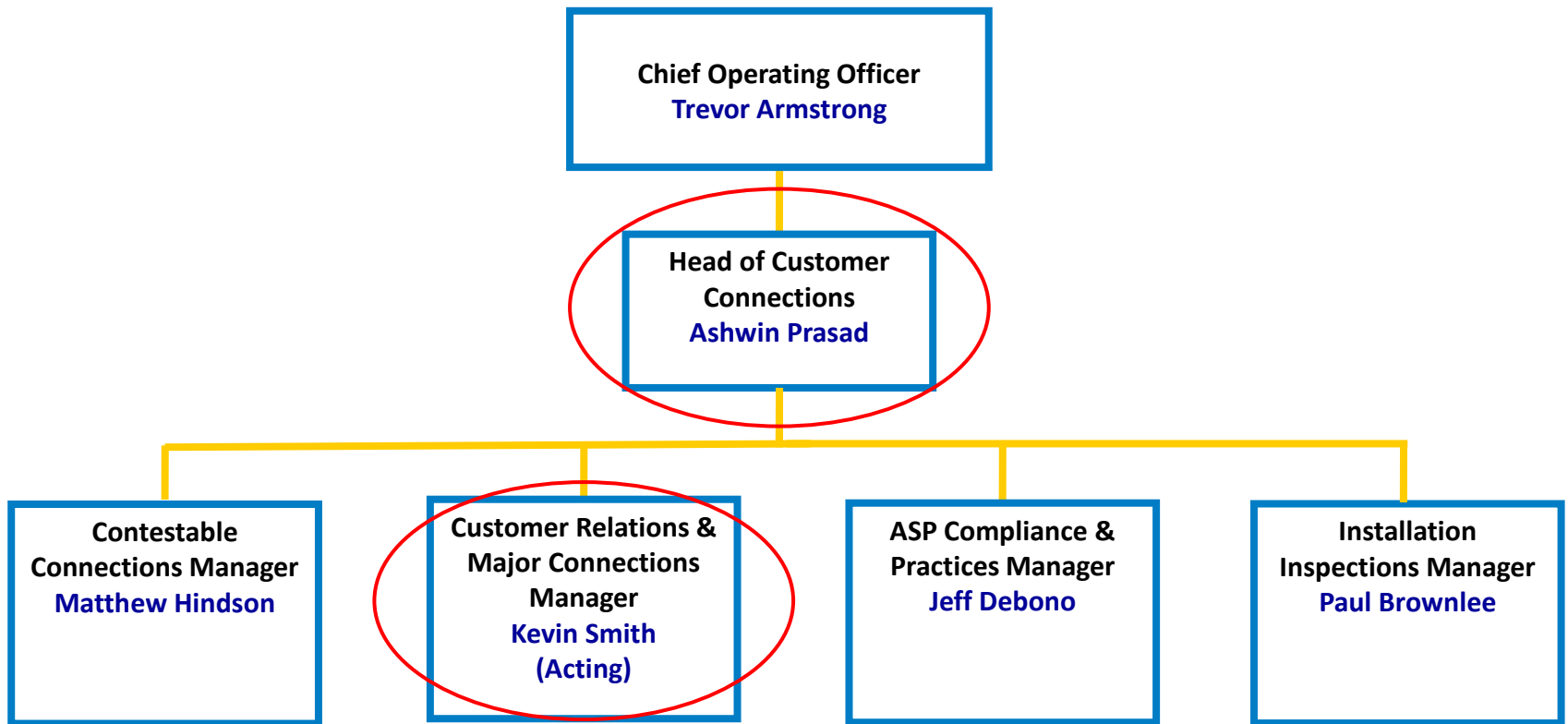
- Changes and Challenges for Ausgrid and ASP/3s
- Customer Connections and Contestable Connections Structures
- AER Regulatory Submission 2019-24
- Ring Fencing Guideline
- Department of Planning & Environment Registration for ASP/3s
- General Updates and Reminders
- Kiosk Substation Design and Construction Review
- Better Connected Project - Connection Application Forms
- Customer Relationship Management (CRM) Project
- Subtransmission Overhead Line Design
- AutoCAD and NET CAD External Design Template

Changes and Challenges for Ausgrid and ASP/3s

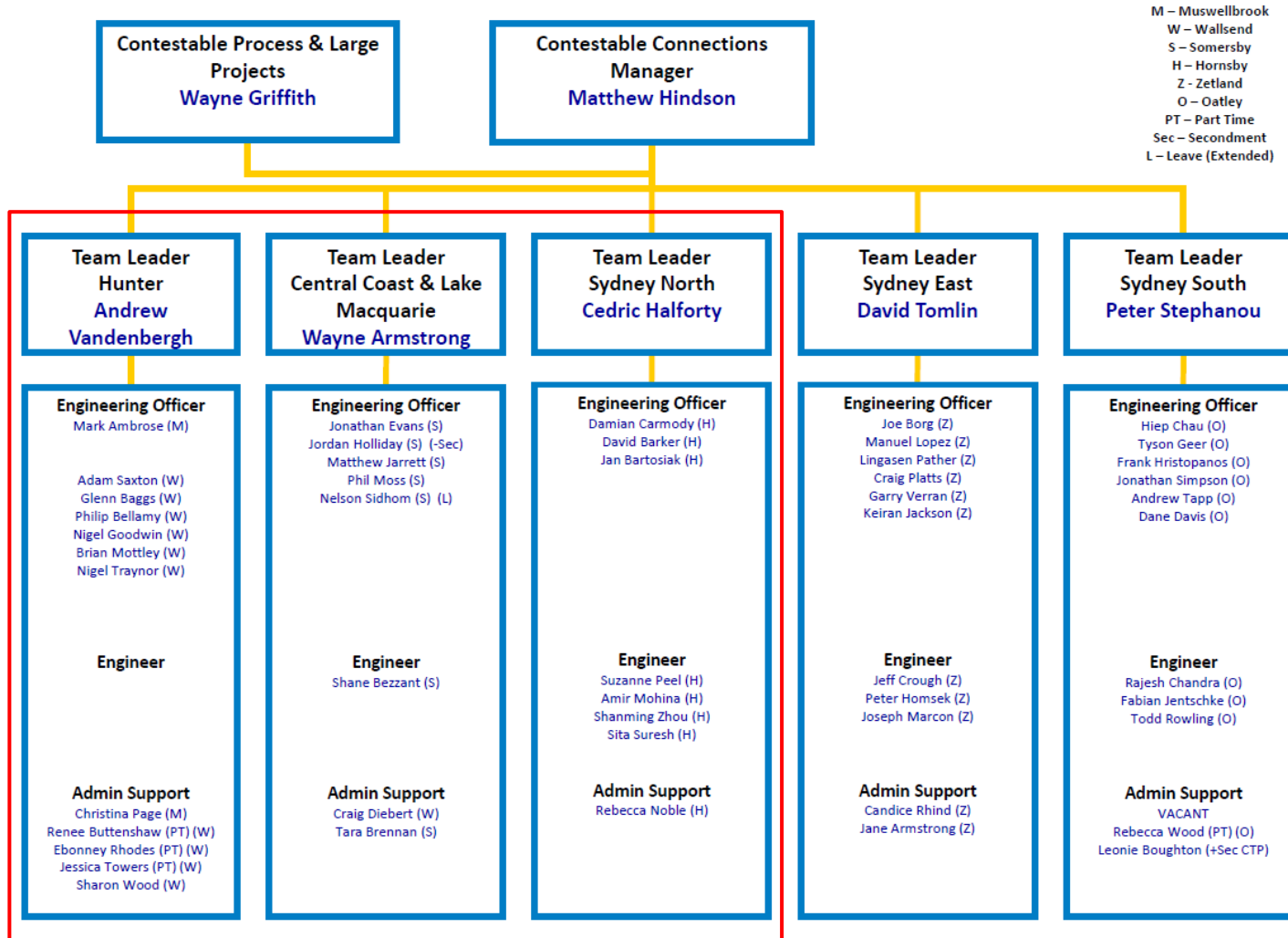
- On 1 December 2016 the [NSW Government](#) entered into a partnership with [AustralianSuper](#) and [IFM Investors](#) to operate Ausgrid under a long-term lease.
- We operate in the National Electricity Market (NEM) as a Distribution Network Service Provider (DNSP).
- Ausgrid continues to develop transformation initiatives and plans for a future where renewables play a major role in the power mix and households and businesses can generate their own energy and sell it back to the grid.
- Ausgrid is continuing to consult with its employees about workforce and business changes.
- This involves staffing changes, including some of the areas you deal with, and who we interact with internally.
- It also affects our processes, which may lead to changes in the way we provide your services.



Customer Connections Structure



Contestable Connections Structure



M – Muswellbrook
W – Wallsend
S – Somersby
H – Hornsby
Z – Zetland
O – Oatley
PT – Part Time
Sec – Secondment
L – Leave (Extended)

15 October 2018

AER Regulatory Submission 2019-24

Every 5 years Ausgrid submits a proposal to the Australian Energy Regulator. This sets out how much revenue we need to recover from our customers to ensure they have safe and reliable power now and in the future.

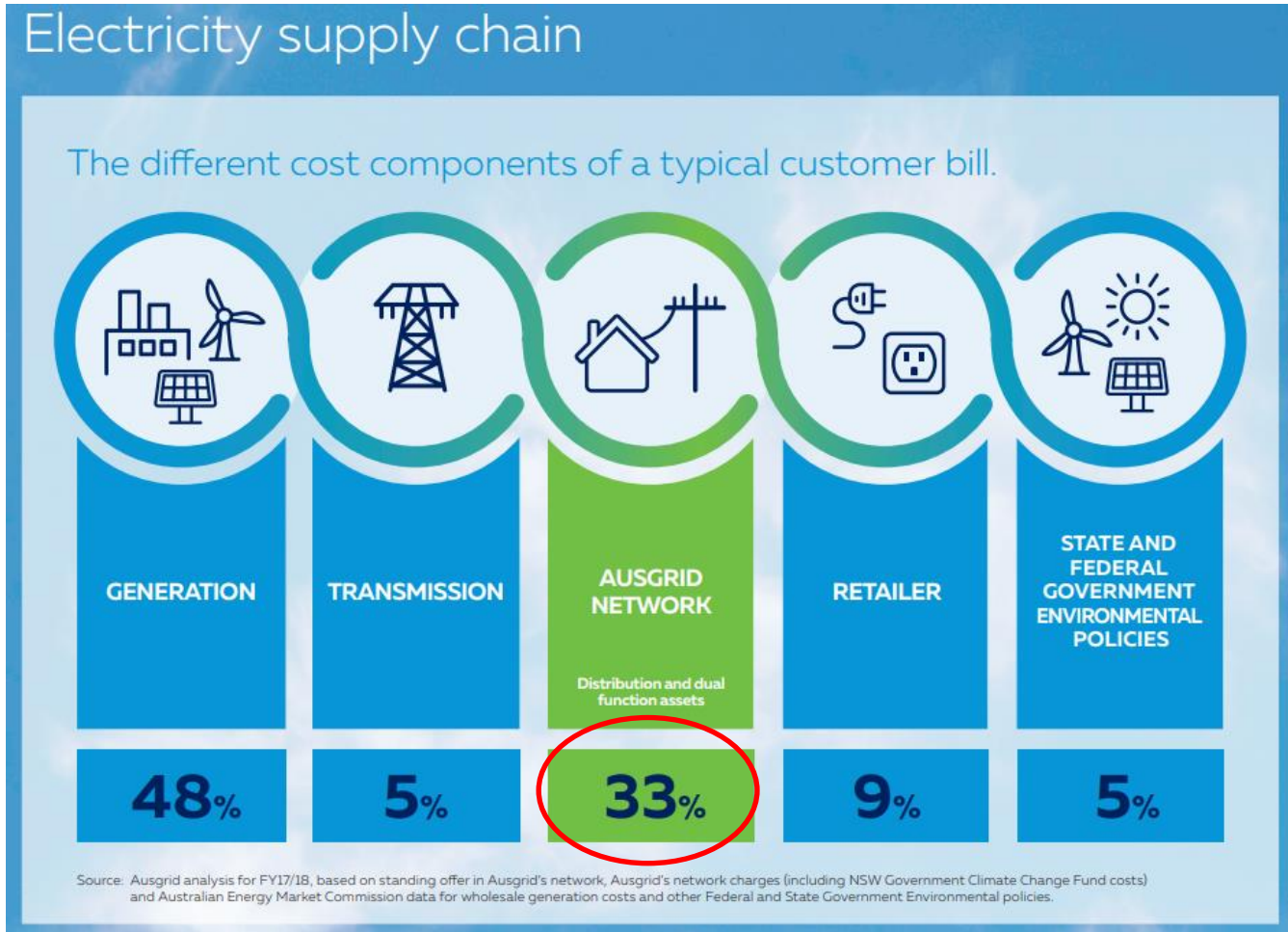
Our role in powering Australia's economic engine

Ausgrid's distribution network supplies Sydney, the Central Coast and the Hunter Valley with the electricity that is essential to our economic activity, our institutions and our way of life.

Ausgrid powering our economic growth



AER Regulatory Submission 2019-24



AER Regulatory Submission 2019-24

Affordable

Savings achieved since 2013 include, 30% reduction in the network component, 23% reduction in operational expenditure (\$100M pa or \$76 pa per customer), and 57% reduction in capital expenditure. Network component of residential bills reduced from 1 July 2017.

Further savings proposed with a reduction of \$100M pa in operational expenditure. Network component of residential bills proposed to reduce 6% from 1 July 2019.

Source: Ausgrid's regulatory proposal for 2019-2024.



AFFORDABLE

- Lower network prices within electricity bills
- Locked in operating savings
- Capital expenditure efficiencies supported by effective demand management
- New pricing structure to improve efficiency and minimise bill shock.

AER Regulatory Submission 2019-24

Reliable

We are proposing \$335M pa in renewing the network, and \$43M pa in technology.



RELIABLE

- Prudent and efficient expenditure that seeks to maintain current levels of reliability
- Infrastructure to connect new customers, including data centres
- Cyber security to protect the grid.

Source: Ausgrid's regulatory proposal for 2019-2024.

AER Regulatory Submission 2019-24

Sustainable

We are playing our role in encouraging customers to invest in renewable technologies while we develop the grid to support the energy mix of the future.

\$58M investing to deliver a flexible network, the future grid, sooner by trialling technologies.

\$41M additional investment in Advanced Distribution Management System.



SUSTAINABLE

- Rewards for using off-peak power
- Support to generate, store and sell solar energy
- Evolution to a smart grid, to support an energy mix that includes more renewables.

Source: Ausgrid's regulatory proposal for 2019-2024.

AER Regulatory Submission 2019-24

Ausgrid's submission aimed to:

- Achieve full cost recovery and reduce cross subsidisation from connected customers
- Reduce cross subsidisation between connecting customers
- Include services not currently included
- Simplify fee structure.

Timetable:

- Draft Determination by AER 1 November 2018
- Ausgrid response by January 2019
- Final Determination by AER April 2019
- New fee structure and fees from 1 July 2019.



AER Regulatory Submission 2019-24

Existing Ancillary Network Services (2014/19) & Proposed Services (2019/24)

Existing 2014 / 19

Services		Type	Units	Price \$ (FY19) ex GST
Administration services relating to work performed by ASPs including processing work				
Underground urban residential subdivision (vacant lots)	Up to 5 lots	Fixed	per service	\$399.65
	6 - 10 lots	Fixed	per service	\$499.56
	11 - 40 lots	Fixed	per service	\$699.39
	Over 40 lots	Fixed	per service	\$799.30
Rural overhead subdivisions and rural extensions	Up to 5 poles:	Fixed	per service	\$399.65
	6-10 poles:	Fixed	per service	\$499.56
	11 or more poles	Fixed	per service	\$899.21
Underground commercial and industrial or rural subdivisions		Quoted/Hourly	Per Hour	\$99.91
Commercial and industrial developments		Quoted/Hourly	Per Hour	\$99.91
Asset relocation or street lighting		Quoted/Hourly	Per Hour	\$99.91
Subdivision involving substations (NEW)		Fixed	per service	\$119.89
Additional services required by ASP/Applicant e.g Guarantee of		Quoted/Hourly	Per Hour	\$99.91

Proposed 2019 / 24

Services	Type	Units	Price \$ (FY19) ex GST
Design related services			
Administration of contestable work			
General	Fixed	per service	\$302.55
Additional	Quoted/Hourly	per hour	\$99.84
Pioneer Schemes	Fixed	per service	\$1,306.75

New

AER Regulatory Submission 2019-24

Existing Ancillary Network Services (2014/19) & Proposed Services (2019/24)

Existing 2014 / 19

Services		Type	Units	Price \$ (FY19) ex GST
Design related services				
Design information				
Underground urban residential subdivision (vacant lots)	Up to 5 lots	Fixed	per service	\$480.64
	6 to 10 lots	Fixed	per service	\$640.85
	11 - 40 lots	Fixed	per service	\$1,121.49
	Over 40 lots	Fixed	per service	\$1,441.91
Rural overhead subdivisions and rural extensions	Quoted/Hourly	Per Hour	\$160.21	
Underground commercial and industrial or rural subdivisions	Quoted/Hourly	Per Hour	\$160.21	
Commercial and industrial developments	Quoted/Hourly	Per Hour	\$160.21	
Asset relocation or street lighting	Quoted/Hourly	Per Hour	\$160.21	
	Quoted/Hourly	Per Hour	\$186.72	
	Quoted/Hourly	Per Hour	\$236.67	
URD including Kiosk/HVDCPT (NEW)	Fixed	per service	\$600.80	
Chambers, Multi Kiosk, CBD Chambers (NEW)	Quoted/Hourly	Per Hour	\$160.21	
Design certification				
Underground urban residential subdivision (vacant lots)	Up to 5 lots	Fixed	per service	\$320.43
	6 to 10 lots	Fixed	per service	\$480.64
	11 - 40 lots	Fixed	per service	\$801.06
	Over 40 lots	Fixed	per service	\$961.28
Rural overhead subdivisions and rural extensions	1 - 5 poles	Fixed	per service	\$320.43
	6 - 10 poles	Fixed	per service	\$480.64
	11 or more poles	Fixed	per service	\$801.06
Underground commercial and industrial or rural subdivisions (vacant lots - no development)	Up to 10 lots	Fixed	per service	\$480.64
	11 - 40 lots	Fixed	per service	\$640.85
	Over 40 lots	Fixed	per service	\$961.28
Commercial and industrial developments	Quoted/Hourly	Per Hour	\$186.72	
Asset relocation or street lighting	Quoted/Hourly	Per Hour	\$160.21	
	Quoted/Hourly	Per Hour	\$186.72	
Kiosk/HVDCPT (NEW)	Fixed	per service	\$961.28	
Chambers, Multi Kiosk, CBD Chambers (NEW)	Quoted/Hourly	Per Hour	\$160.21	
Design rechecking				
Underground urban residential subdivision (vacant lots)	Quoted/Hourly	Per Hour	\$160.21	
Rural overhead subdivisions and rural extensions	Quoted/Hourly	Per Hour	\$160.21	
Underground commercial and industrial or rural subdivisions	Quoted/Hourly	Per Hour	\$160.21	
Commercial and industrial developments	Quoted/Hourly	Per Hour	\$186.72	
	Quoted/Hourly	Per Hour	\$236.67	
Asset relocation or street lighting	Quoted/Hourly	Per Hour	\$186.72	
	Quoted/Hourly	Per Hour	\$236.67	

Proposed 2019 / 24

Services	Type	Units	Price \$ (FY19) ex GST
Design related services			
Design information			
Simple	Fixed	per service	\$696.55
Standard / Complex	Quoted/Hourly	per hour	\$199.01 \$236.51
Asset creation	Fixed	per asset number	\$26.96 (base) \$9.98 (per asset)
Design certification			
General	Fixed	per service	\$1,926.46
Other	Quoted/Hourly	per hour	\$199.01 \$236.51

New

AER Regulatory Submission 2019-24

Existing Ancillary Network Services (2014/19) & Proposed Services (2019/24)

Existing 2014 / 19

Services	Type	Units	Price \$ (FY19) ex GST
Preliminary enquiry service			
Preliminary enquiry service	Quoted/Hourly	Per Hour	\$226.68
Connection offer service (basic or standard)			
Basic 100A Connections NDT requiring a load slip	Fixed	per service	\$8.32
Basic 100A Connections requiring a load slip or	Fixed	per service	\$211.69
Standard Off-Site or On-Site Augmentation Work	Fixed	per service	\$211.69
Standard Offer ASP1 Connections	Fixed	per service	\$270.74
Standard Embedded Generation >5MVA capacity	Quoted/Hourly	Per Hour	\$236.67
Planning studies			
Carrying out planning studies and analysis relation to distribution (including sub-transmission and dual-function assets) connection applications	Quoted/Hourly	Per Hour	\$236.67

Proposed 2019 / 24

Services	Type	Units	Price \$ (FY19) ex GST
Connection application related services			
Technical assessment and preliminary enquiry			
Technical assessment - Applications or relocations	Fixed	per service	\$411.27
Preliminary enquiry	Quoted/Hourly	per hour	\$199.01
Connection offers			
Basic	Fixed	per service	\$16.97
Standard	Fixed	per service	\$49.92
Negotiated	Quoted/Hourly	per hour	\$236.51
Other connection application related services			
Planning studies	Quoted/Hourly	per hour	\$199.01
Site inspection	Fixed	per service	\$489.57
Technical Support - Permanently Unmetered Supply (P	Quoted/Hourly	per hour	\$199.01
Registered participant support	Quoted/Hourly	per hour	\$236.51

New

New

New

New

AER Regulatory Submission 2019-24

Existing Ancillary Network Services (2014/19) & Proposed Services (2019/24)

Services	Type	Units	Price \$ (FY19) ex GST
Contestable substation commissioning			
Underground urban residential subdivision (vacant lots)	Fixed	per service	\$2,018.50
Rural overhead subdivisions and rural extensions	Fixed	per service	\$1,189.91
Underground commercial and industrial or rural subdivisions	Fixed	per service	\$2,584.29
Commercial and industrial developments	Quoted/Hourly	Per Hour	\$160.21
Asset relocation or street lighting	Quoted/Hourly	Per Hour	\$160.21
Complex & Chamber substations (NEW)	Quoted/Hourly	Per Hour	\$160.21
Access Permits			
Underground urban residential subdivision (vacant lots)	Fixed	per service	\$2,042.31
Rural overhead subdivisions and rural extensions	Fixed	per service	\$2,042.31
Underground commercial and industrial or rural subdivisions (vacant lots - no development)	Fixed	per service	\$2,042.31
Commercial and industrial developments	Fixed	per service	\$2,042.31
Asset relocation or street lighting	Fixed	per service	\$2,042.31
Complex & Chamber substations (NEW)	Quoted/Hourly	Per Hour	\$160.21
Clearance to work			
Clearance to work	Fixed	per service	\$1,041.39
Access (standby person)			
Access (standby person)	Quoted/Hourly	Per Hour	\$148.53
Connection / relocation process facilitation			
Connection / relocation process facilitation	Quoted/Hourly	Per Hour	\$226.68
Customer interface coordination for contestable works			
Customer interface coordination for contestable works	Quoted/Hourly	Per Hour	\$224.18
Contestable network commissioning and decommissioning			
Commissioning assets			
Simple	Fixed	per service	\$1,693.25
Standard	Fixed	per service	\$3,340.90
Complex	Quoted/Hourly	per hour	\$160.10
Decommissioning assets			
Decommissioning assets	Quoted/Hourly	per hour	\$160.10
Access Permit, oversight and miscellaneous services			
Access permits and clearances to work			
Simple permit or clearance to work	Fixed	per service	\$1,280.82
Complex permit or clearance to work	Quoted/Hourly	per hour	\$160.10 or \$199.01 or \$160.00
Cancellation - Simple	Fixed	per service	\$496.32
Cancellation - Complex	Fixed	per service	\$1,136.72
Install / remove overhead network earths	Quoted/Hourly	per hour	\$150.00
Other access permits and clearances to work			
Access - standby person	Quoted/Hourly	per hour	\$150.00
Access - confined space entry permit	Quoted/Hourly	per hour	\$160.10
Process and project facilitation	Quoted/Hourly	per hour	\$199.01
Specialist services	Quoted/Hourly	per hour	\$236.51

New

New

New

New

New

New

AER Regulatory Submission 2019-24

Existing Ancillary Network Services (2014/19) & Proposed Services (2019/24)

Existing 2014 /19

Services	Type	Units	Price \$ (FY19) ex GST
Authorisation of ASPs			
Level 1 ASP	Fixed	per service	\$607.05
Level 2 ASP	Fixed	per service	\$420.34

Proposed 2019 /24

Services	Type	Units	Price \$ (FY19) ex GST
Authorisation of ASPs			
Level 1 ASP			
Authorisation/Re-authorisation (Annual Fee)	Fixed	per service	\$311.39
Recording of an additional company to existing auth	Fixed	per service	\$49.92
Upgrade to include additional class	Fixed	per service	\$168.17
Company Authorisation - Initial	Fixed	per service	\$641.19
Company Re-authorisation (Annual Fee)	Fixed	per service	\$110.25
Level 2 ASP			
Initial Authorisation	Fixed	per service	\$740.25
Re-authorisation (Annual Fee)	Fixed	per service	\$339.99
Additional authorisation	Fixed	per service	\$99.04
Level 3 ASP			
Authorisation/Re-authorisation (Biennial Fee)	Fixed	per service	\$74.88

New
New
New
New
New
New
New
New

AER Regulatory Submission 2019-24

Proposed Labour Rates (2019/24)

Table 15-9 Quoted service ancillary network services hourly labour rates for 2019–20, draft decision (\$2019–20)

Ausgrid/AER labour category	AER draft decision - maximum total hourly rate (base plus on-costs plus overheads) escalated to 2019–20
Admin (R1)	\$103.24
Technical Specialist (R2)	\$157.11
Engineer/Senior Engineering officer (R3)	\$196.39
Field worker (R4)	\$151.40
Senior Engineer (R5)	\$216.02
Engineering Manager	\$261.74

Ring Fencing Guideline

The AER **Ring Fencing Guideline** has important implications for what services Ausgrid can provide and the way we do business. From 1 January 2018 Distribution Network Service Providers (DNSPs) can not undertake any competitive and contestable electricity services.

Vulnerable Customers

- Ausgrid considers some customers may be unable to source supply restoration services from contestable markets, and that this could endanger their health and safety.
- A protocol has been developed by Ausgrid to guide staff in assessing whether a customer meets criteria to qualify for assistance.
- The protocol requires we inform customers the work is contestable and shouldn't be completed by Ausgrid, and we must obtain the customer's acknowledgment that they have been advised of this.
- The protocol recognises regardless of the particular circumstances (network related safety considerations aside), the behaviour constitutes a breach of the Ring Fencing Guideline and will be reported to the AER within 5 business days.

Department of Planning & Environment

Registration Letter for ASP/3s

- ES4 updated September 2017 to align with the ASP Scheme Rules.
- Included a requirement for ASPs to be individually registered with the Department of Planning & Environment (DPE) in order to renew their authorisation.
- This change was communicated at the ASP/3 seminar December 2017.
- Ausgrid recognises ASP/3s are struggling to meet individual registration requirements of the ASP Scheme.

Department of Planning & Environment

Registration Letter for ASP/3s

- Requirement for individual registration of existing authorised persons will be relaxed until the ASP Scheme Rules are next reviewed.
- Renewals and change of employer don't need a registration letter from DPE.
- Individuals that have never been authorised with Ausgrid will need registration letter. Process for ES4 has not changed.
- Authorisation is tied to the company you work for, if you change the ASP/3 company you work for you will need to advise us. If you work for more than one you need authorisation for each one.
- Ausgrid will continue to work with the DPE for a workable long term solution regarding the criteria for registration.

General Updates and Reminders

Relocation Policy

- On 1 January 2018 we revised our Asset Relocation Policy to reflect the changes introduced by the Ring Fencing Guideline.
- Changes included:
 - A revised Asset Relocation Policy to reflect the changes introduced by Ring Fencing Guideline.
 - A Network Asset Relocation Request (NARR) form for standalone relocations NOT associated with new or altered connections. Where a network asset relocation is associated with a new or altered connection, continue to use the NECF03 form.
 - An Asset Relocation Contract that covers the construction and electrification phase of network asset relocations. The design phase will continue to be covered by the Contract for Design Related Services.
 - Further information on the Relocation Policy can be found at <https://www.ausgrid.com.au/Connections/Asset-relocations>



General Updates and Reminders

Removal of Redundant 11kV OH Mains

- For projects involving installation of 11kV UGOHs, e.g. associated with installation of a kiosk substation(s) in an OH area or where OH mains may become redundant due to a contestable OH mains extension; for operational reasons the default position is to **remove the redundant 11kV OH mains unless advised otherwise by Ausgrid.**
- NS126 *Construction of High Voltage Overhead Mains* will be amended to make this clearer.



Public Consultation

- When designing new works or relocating existing assets (including Service works), the **ASP/3** is responsible for consulting and obtaining written approval, or evidence of consultation, with impacted property owners and other parties.

NS104, NS167, clause 11.2, dot point 3: "If it is proposed to relocate a pole to a position in front of a property which is not owned by the applicant, then the applicant must obtain written agreement from the owner of that property for the pole to be placed in that position"

General Updates and Reminders

ASP/1 and ASP/3 Pre-Construction Meeting

- From a technical, safety and buildability perspective it is important the authorised ASP/3 designer responsible for the design, or another authorised ASP/3 company representative familiar with the design, attends the pre-construction meeting.

Use of Composite Fibre Cement (Titan) Poles

- Ausgrid is investigating the introduction of Composite Fibre Cement poles for use with all new pole mounted equipment such as pole transformer substations and intellirupters.
- A review of the Network Standards, component and assembly drawings, and associated documentation is under way to allow for the design and construction of these new poles.
- We will keep you informed in relation to the future use of Titan Composite Fibre Cement poles.
- Until instructed, continue to design using timber poles for all new pole mounted equipment.



General Updates and Reminders

Access to Strategic Communications Corridor Details

- We have received an enquiry about gaining access to the Strategic Communications Corridor via the WEBGIS.
- Based on a business assessment it was decided that for network security reasons the data depicting the Strategic Communications Corridors could not be approved for release.

Communication and Escalation Protocols

- If an ASP/3 does not agree with a CPC determination they should contact the **Team Leader** first to discuss.
- If a resolution is still not able to be achieved with the Team Leader the issue will be escalated to Contestable Connections Manager.



General Updates and Reminders

- As part of our commitment to Sustainable Procurement, we have recently released a new document for our suppliers and external partners, the [External Partner Code of Conduct](#). This Code sets out Ausgrid's expectations of our external partners and their supply chains in providing goods and services to our organisation. This Code replaces the existing Statement of Business Ethics.
- Our Code of Conduct aims to set out the kind of behaviour expected of us all by defining our corporate values and ethical principles. These values and principles must form the basis of everything we say and don't say; what we do and don't do.

Copies of each are available on our website.



General Updates and Reminders

Earth Test Results

- Soil resistivity test results need to be submitted using the NS116 Wenner method test sheet format and layout with all required fields to be completed.
- Incomplete test sheet information or information provided in a format not compatible with our earthing tools will delay the analysis and earthing design process.
- Incorrect design inputs result in inaccurate and misleading outcomes for site electrical safety.
- Investigating making an editable pdf test sheet form for ASP/3s to use.



Ausgrid Kiosk Review



Darko Grcev and Peter Turrin

Transmission & Distribution Subs Engineering



Kiosk Construction & Installation



Kiosk unloading from truck



Kiosk installing on concrete tub

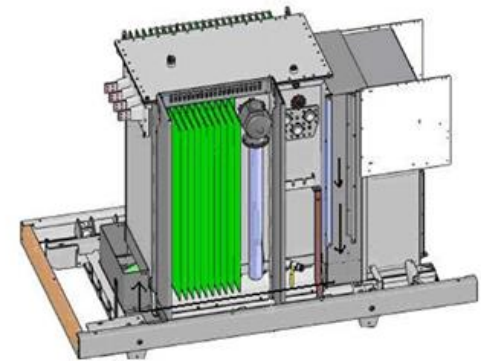
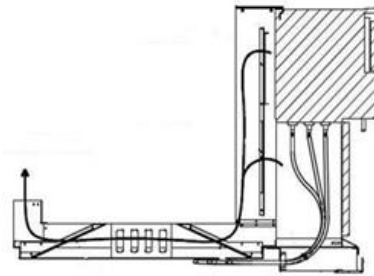
- Two approved suppliers Wilson Transformer Co & Schneider Electric, both kiosks are equivalent within the range of 400 to 800kVA ratings.
- Prefabricated, factory assembled and tested, minimal site works.
- Ready for Ausgrid or ASP (Accredited Service Provider) installations.

HV Switchgear - IAC

IAC for both Public and Operator Safety



Internal Arc Chamber



Schematic of Internal Arc Control and chamber

Kiosk Transformers

- Ausgrid's cyclic Load Cycle ratings require Tx manufacturers to achieve ratings within kiosk housing that are above nameplate rating.
- To fit within Ausgrid kiosk footprint (KL 2.7m x 1.5m).
- 1000kVA Tx design very challenging for the space available - typically 800kVA Tx tank fitted with a 1000kVA Cu LV & HV winding cores.
- Cu/Cu distribution Tx design rare in Australia – higher cost.
- Tx sizes in kiosks - 400kVA to 1000kVA in L type kiosks and 1500kVA in K type kiosks.

LV Switchgear - SAIF LV board



Typical SAIF Low Voltage Board 800A/400A/800A

1600A Ganged Disconnecter / Isolator

1000-1600A Bolt-in Fuse Cabinet



SAIF 1600/1000A Fuseway w/ 400A Fuseway

LV Switchgear

- Ausgrid exclusive use of SAIF (**S**witch **A**nd **I**nsulated **F**usegear) enclosed fuseboards in kiosks since 2004, replaced SCC (Sydney County Council) 'open' type LV boards.
- SAIF board 'dead front', fully shrouded, touch safe.
- Achieves thermal ratings in Australian conditions unlike most other DIN/European designs.
- 400Amp Ausgrid rating Vs 315Amp common DIN rating, allows up to six (6) 400A fuseway modules or lessor combinations of 400A & 800A fuseways.
- Provides high current fuseway up to 1600Amps in Australian conditions, unlike other market designs.
- Heavy current fuseways typical for large or industrial customers (such as Woolworths/Coles/Bunnings and High Rise residential installations).

LV Switchgear

- Allows bolted type BS (British Standard) fuse connections rather than DIN fuse designs which rely on fuse blade for contact/switching.
- DIN design more likely to lead to 'hot' connections during life.
- Single phase switching of 800-400A Network Distributors, ergonomically easier for Operators, Fault make/Load break **independent manual** switching.
- Modular fuseways readily replaceable or substituted for higher ratings.

Kiosk Housing

- Steel housings initially which do not add fuel in the event of kiosk fire but subject to corrosion.
- Fibreglass housing consumed in event of kiosk fire, however not subject to corrosion providing longer housing life.
- Anti graffiti paint introduced to both new and repainted kiosk housings since 2004.
- Ventilation necessary to dissipate heat and maintain ratings.
- Housing removable / replaceable.
- Currently KK kiosks have Metallic Aluminium housings due to low production volumes that do not support development of fibreglass housings.



Kiosk Base



- **Concrete 'tub' design:**
 - addresses sloping sites.
 - allowed subsequent inclusion of oil retention 'bunding' within kiosk site without impacting the kiosk layout or its thermal capacity.
- **Padmount designs:**
 - (no concrete tub) as per K kiosk require non sloping/level sites, not usually an issue for sites within property boundary.

Kiosk Substations



Padmount Square kiosk trial
Muswellbrook NB: unable to cater for site slope



Typical sloping site install

Typical internal padmount oil containment 'tub' stifles air flow and impacts ratings



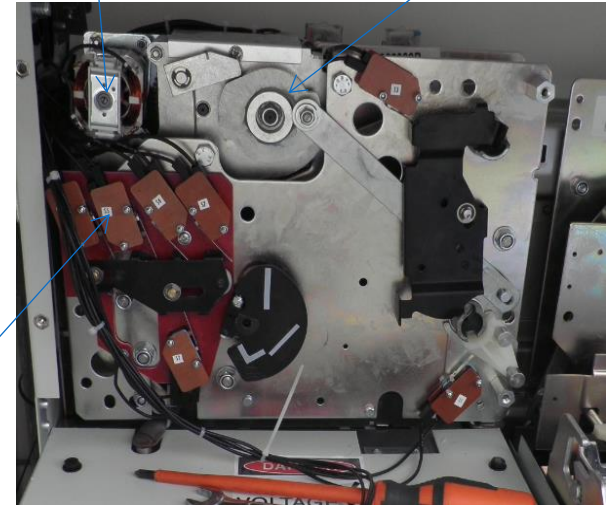
HV Switchgear Automation

- Inclusion of motor packs and indication circuitry on feeder ring switches within both the Schneider RM6 & ABB Safelink RMU's for KL kiosks powered from the 24VDC DMC battery pack.
- Inclusion of SF6 low pressure indication switch for remote indication of inadequate gas pressure.
- Local/Remote control isolation switch.

RM6 mechanism motor

Motor gearbox mechanism

RM6 indication switches



Motor control board

RM6 Gas pressure switch



Distribution Monitoring & Control (DMC)

- Ausgrid introduced DMC in 2011 and now have large number of kiosks with active DMC devices.
- Latest development - new DMC solution (Schneider T300 RTU) in KL Schneider kiosks introduced 2018.
- DMC provides central control capability of HV ring switches and monitoring of LV volts all phases, each LV distributor phase current, HV feeder current.

DMC - Solutions



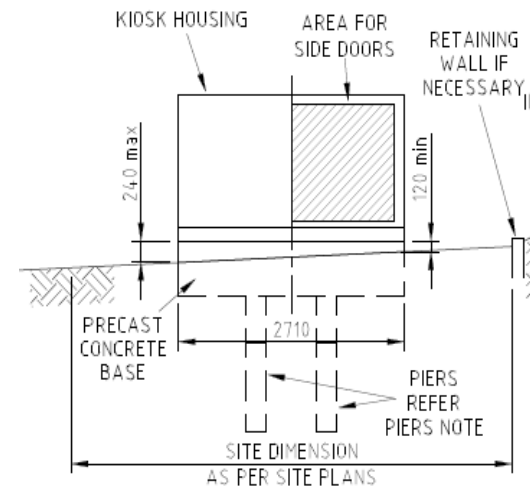
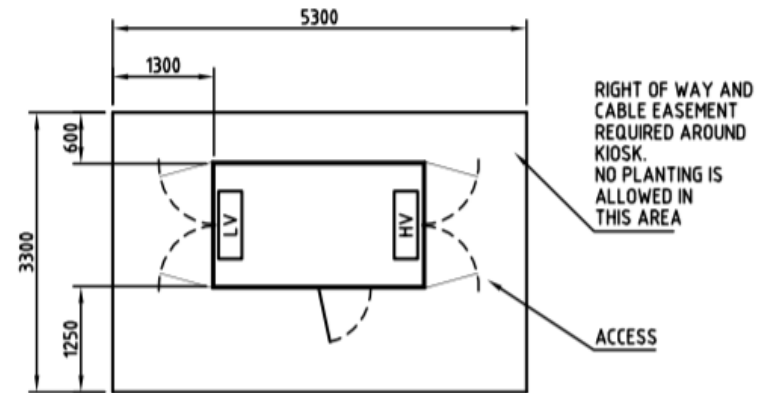
WTC DMC
arrangement of
Powersense boxes



Schneider DMC
arrangement of T300 RTU

Ausgrid Key Requirements

- Footprint for KL 2.7m x 1.5m Rectangular shape.
- Tub type base for sloping Sydney Region sites.
- Ratings achievable on cyclic load basis.
- LV distributors 400A rating to enable best asset utilisation and provide LV paralleling capacity.
- Piering of kiosk base for stability.



Ausgrid Key Requirements

- Up to 5 x 400A LV distributors for heavy urbanised areas and limited kiosk sites.
- Configurations with up to 1600A distributors.
- Packaged for minimal site works.
- IAC of kiosk for Public and Staff safety.
- Oil containment within site to minimise environmental impact and car hit kiosk spills into adjacent street drainage.
- Monitoring and remote control of kiosk.



Kiosk Review Questions

- Concrete 'tub' base retention or padmount arrangement.
- LV options, change from 400A to 315 A fuseways.
- Removal of heavy current distributors eg 1000A- 1600A fuseways.
- What design aspects of Ausgrid kiosks present challenges.
- Other utilities kiosk designs.

Better Connected Project Update

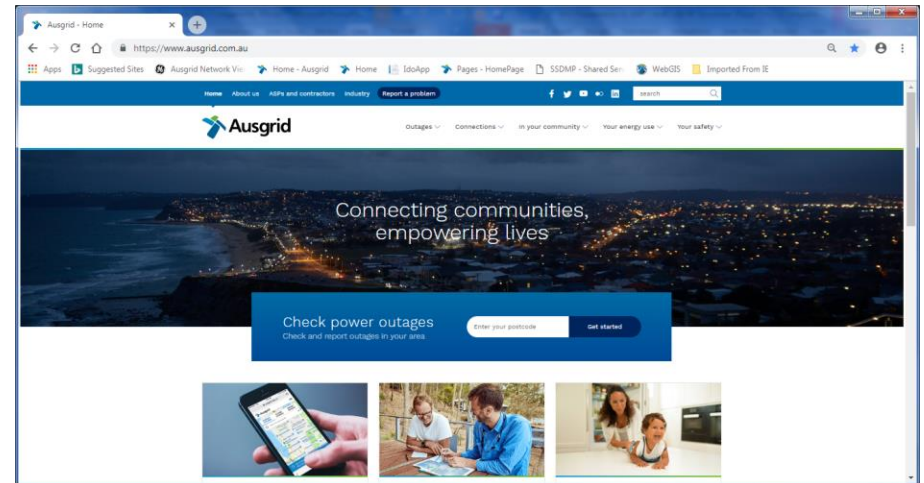


Wayne Armstrong
Contestable Connections Team Leader



Overview

- Update on provide an overview of the key focus areas that we are working on to improve our digital capabilities.
- Q1 2019 Installation Data Operations – Connection Application SmartForm enablement.
- Then Web Portal development for our industry partners.CRM
- Our aim is to maximise digital capabilities for customer/industry and will be our focus for 2019 and beyond.



Frustrations – with the current Forms

Review of Feedback on our current forms:

- Which form to use can be confusing.
- Length of Forms in particular NECF 03 (too long).
- Unsure of what the term “expedited” means within the Connection Application forms – standard T&Cs.
- Forms are outdated meaning some mandatory questions are hard to answer and not relevant whilst other questions that are relevant are missing.
- Nowhere to write a comment on the form to provide relevant information.

Connections

Application forms and guides

Our National Energy Customer Framework (NECF) connection forms provide a standard framework for making connections applications. You can find all the various types of connection application forms and guides below.

We're improving our connection process to make applications easier for our customers. In coming months, all application forms will be lodged online, replacing PDF and excel versions.

Application forms and guides

⊕	Connection Application Form (NECF01) - preliminary enquiries
⊕	Connection Application Form (NECF02) - residential and small commercial connections
⊕	Connection Application Form (NECF03) - large, multiple and remote connections
⊕	Connection Application Form (NECF04) - embedded and standby generation
⊕	Connection Application Form (NECF05) - installation of micro embedded generation
⊕	Connection Application Form (NECF07) - installation of permanently unmetered supplies (PUMS)

Connection Application SmartForm capabilities

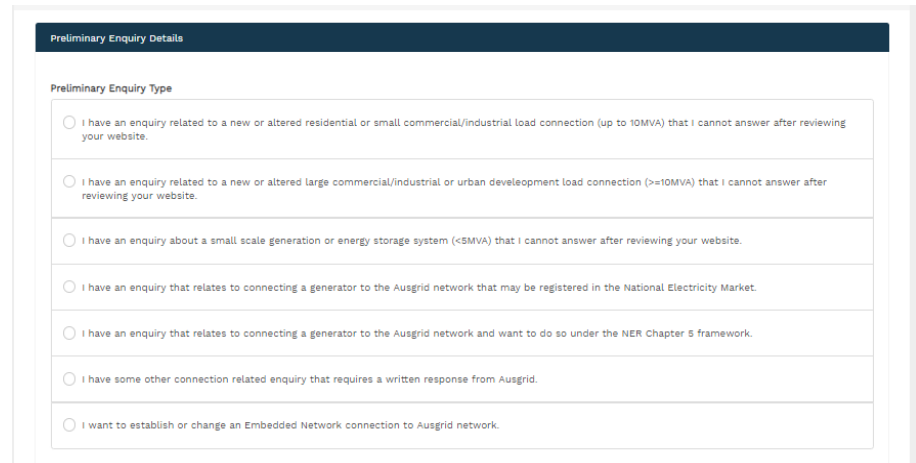
- We have been working on streamlining and automating processes for our connection customers.
- In Quarter 1, 2019 we will be introducing SmartForm technology to support connection applications. →
- SmartForm technology benefits: →
 - Easy-'intuitive' to complete.
 - Fewer data and processing errors.
 - Reduces time to complete (in field).
 - Associated documents can be attached.

Application forms and guides

⊕	Connection Application Form (NECF01) - preliminary enquiries
⊕	Connection Application Form (NECF02) - residential and small commercial connections
⊕	Connection Application Form (NECF03) - large, multiple and remote connections
⊕	Connection Application Form (NECF04) - embedded and standby generation
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⊕	Connection Application Form (NECF07) - installation of permanently unmetered supplies (PUMS)

Key Benefits to our Applicant Customers

- SmartForm enabled to support an enhanced customer experience:
 - Easier to determine which form to use.
 - Simplified.
 - Only questions that are relevant to the application are asked.
 - Ability to attach relevant documentation.
- Simplified process by automating form submission processes e.g. paperless experience.
- Easy to use, easy to understand and easy to submit.
- Quick and secure upfront payment process.
- [Ausgrid Website: Connecting to the Network](#)



The screenshot shows a web form titled "Preliminary Enquiry Details". Below the title is a section labeled "Preliminary Enquiry Type" containing a list of radio button options for selecting the type of enquiry. The options are:

- I have an enquiry related to a new or altered residential or small commercial/industrial load connection (up to 10MVA) that I cannot answer after reviewing your website.
- I have an enquiry related to a new or altered large commercial/industrial or urban development load connection (>=10MVA) that I cannot answer after reviewing your website.
- I have an enquiry about a small scale generation or energy storage system (<5MVA) that I cannot answer after reviewing your website.
- I have an enquiry that relates to connecting a generator to the Ausgrid network that may be registered in the National Electricity Market.
- I have an enquiry that relates to connecting a generator to the Ausgrid network and want to do so under the NER Chapter 5 framework.
- I have some other connection related enquiry that requires a written response from Ausgrid.
- I want to establish or change an Embedded Network connection to Ausgrid network.

Preliminary Enquiry Form Overview



Preliminary Enquiry

Reference Code : 0007531

Location

Applicant

Enquiry Details

Summary and Payment

Complete

Preliminary Enquiry

Retailer

NMI

Meter Number

Property Name

Property Type

*Land Title Type

Floor Number

Unit/Shop Number

Street Number/RMB

or

Lot Number

or

Lot/DP Number

*Street Name

Nearest Cross Street

*Suburb

*Postcode

*Land Zoning

Next

Preliminary Enquiry Form Overview



Preliminary Enquiry Reference Code : 0007531

Location **Applicant** Enquiry Details Summary and Payment Complete

Preliminary Enquiry

***Applicant Type**
Real Estate Developer

***Title** ***First Name** ***Last Name**
Mr w a

***Email Address** ***Confirm Email Address**
warmstrong@ausgrid.com.au warmstrong@ausgrid.com.au

Search by ABN, ACN Company Name

Floor Number Unit/Shop Number Street Number/RMB PO Box/Locked Bag
30

***Street Name** **Nearest Cross Street**
Kangoo Road

***Suburb** ***Postcode** ***Phone Number** **Other Number**
Somersby 2250 0285696731

Save your company details for future applications.

Back Save & Share Next



Preliminary Enquiry Form Overview

Preliminary Enquiry Reference Code : 0007531

Location > Applicant > **Enquiry Details** > Summary and Payment > Complete

Preliminary Enquiry

Preliminary Enquiry Details

Preliminary Enquiry Type

- I have an enquiry related to a new or altered residential or small commercial/industrial load connection (up to 10MVA) that I cannot answer after reviewing your website.
- I have an enquiry related to a new or altered large commercial/industrial or urban development load connection (>=10MVA) that I cannot answer after reviewing your website.
- I have an enquiry about a small scale generation or energy storage system (<5MVA) that I cannot answer after reviewing your website.
- I have an enquiry that relates to connecting a generator to the Ausgrid network that may be registered in the National Electricity Market.
- I have an enquiry that relates to connecting a generator to the Ausgrid network and want to do so under the NER Chapter 5 framework.
- I have some other connection related enquiry that requires a written response from Ausgrid.
- I want to establish or change an Embedded Network connection to Ausgrid network.

Please outline the details of your enquiry

***Your Question(s) (up to 500 characters)**

Please provide maximum capacity of the substation location at the front of the premises

Attach any supporting documents

[Browse File...](#)

[Back](#) [Save & Share](#) [Next](#)

What's Next: 2019 and beyond

- The Connection Application SmartForm initiative is considered by Ausgrid as the significant step towards a broader goal to improve customer Interaction.
- To further improve our Customer Experience, the next goal is to provide a Customer Self Service Portal via our CRM initiative, with first functionality (NOSW) going online in early 2019
- This is part of a broader Customer Platform initiative.
- We will keep you updated as we progress.



Self-service web portals in Dynamics 365

 Microsoft Dynamics 365

[Microsoft Dynamics for Projects](#)

Customer Relationship Management (CRM)

Andrew Vandenberg
Contestable Connections Team Leader



CRM – Outline

- Microsoft Dynamics 365 (D365) software platform
- Manage key interactions with our customers and partners
- Provide Ausgrid a 360 degree view of our customers
- Provide transparency to customers
- Key part of Ausgrid's digital transformation and customer initiative



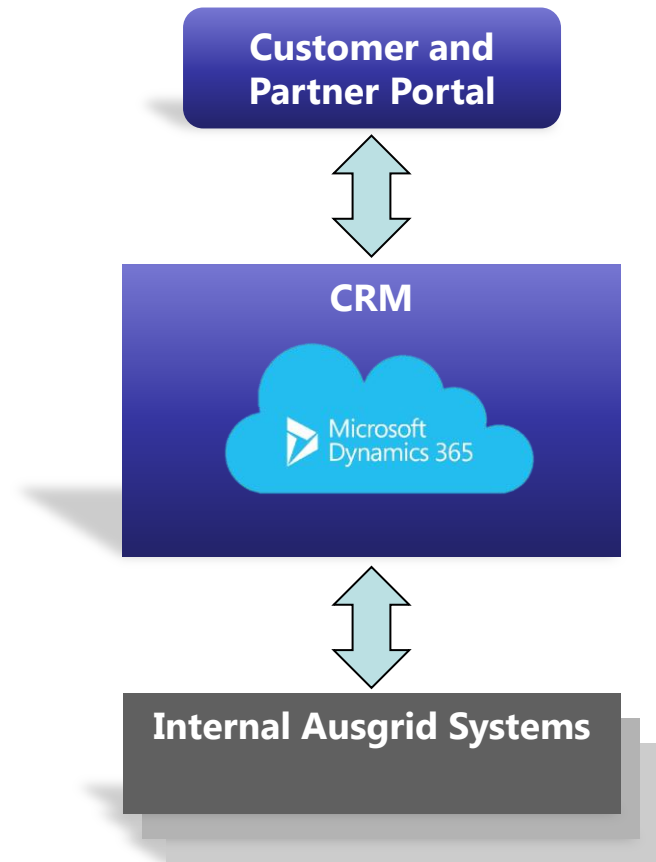
CRM – Outcomes

- Provide an **efficient, enjoyable (!) and more transparent** customer journey through the connection process
- **Reduce our cost to serve** for our customers ... in turn reducing their costs to connect at Ausgrid
- Increase **staff and customer accountability** through the connection process

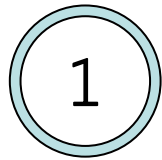


CRM – Solution

- Dynamics 365 (D365) core database for running contestable projects
- D365 Partner and Customer Portal for customers and ASPs
- Integration with key existing systems for increased internal efficiency and accuracy



CRM – 8 Ausgrid business areas



Customer and partner management



Contestable Connections and Major Connections



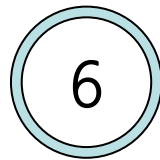
Customer Contact Centre



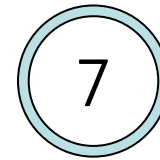
Notification of Services of Work (NOSW)



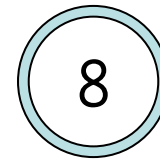
Claims



Complaints including escalations



Recoveries

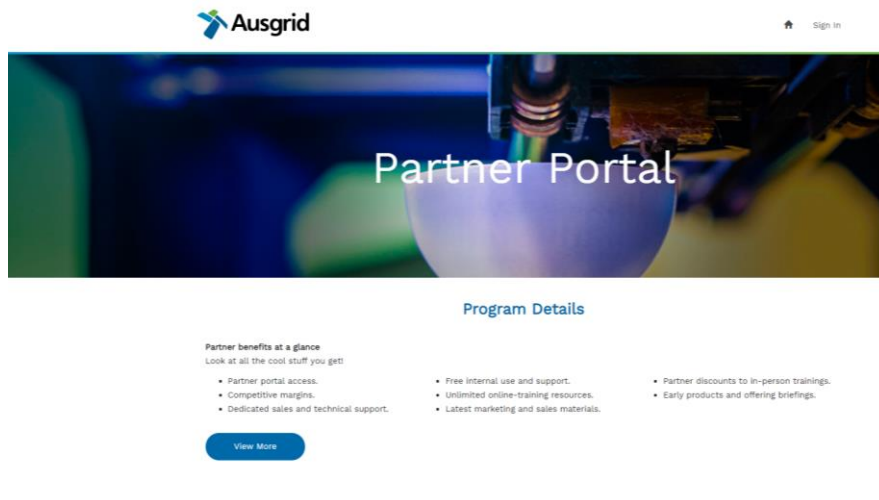


Planned interruptions and outages messaging (Customer touch points)

*Under review

CRM Customer and Partner Portal

- Web based self service portal for our customers and partners
- Portal functionality for contestable and major connections
 - End to end project transparency for customers and ASPs (status, milestones)
 - Communication and document exchange
 - Offer issue and acceptance



CRM – When....

- Notification of Service Work (NOSW) } Feb 2019*
- Planned/ Unplanned Outages & Interruptions
- Complaints
- Claims
- Recoveries
- Customer Contact & Preference Centre
- **Contestable Connections & Major Connections** } May 2019*

* Timeline subject to change

Subtransmission Overhead Line Design



Jonathon Marriott
Engineer – Mains Design



Subtransmission Overhead Line Design

Summary

- Introduction
- Designer Toolkit
- Survey
- Weather & Feeder requirements
- Modelling
 - Software / Survey Data
 - EMF / Community Impacts
 - Insulation Coordination
 - Design Clearances
 - Pole Loading Calculations
 - Foundation Design
- NS181 – Network Standard Variations
- Safety-in-Design (SiD) & Constructability
- Peer Review & Construction Plans

Introduction

Mains Design

- Responsibilities
- Capabilities
- Our role with ASP/3 design



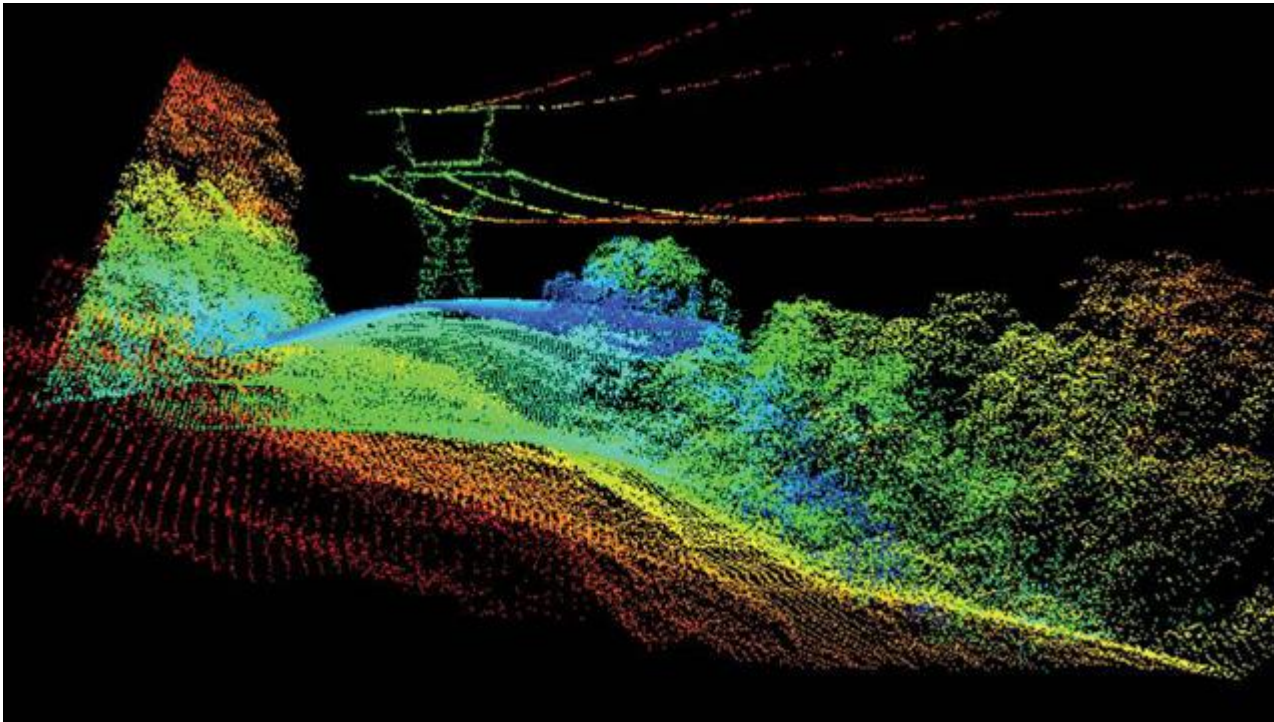
Designer Toolkit

- Ausgrid Electrical Safety Rules
- Network Standard NS220
- AS/NZS 7000:2016
- Other Ausgrid Network Standards
- Engineering knowledge – Electrical / Structural / Geotechnical / Survey
- Line Design Software
- Calculator
- Manufacturers data sheets
- CAD
- Professional network

Survey

Collecting field data

- LiDAR (Light Detection and Ranging)
 - Pros & Cons



Survey

- Professional survey
- Handheld survey tools (eg, ike)
- Laser measuring device
- Pole diameter tapes
- Thermometer & Anemometer
- Contour data

Additional methods of data gathering:

- As-built plans
- Ausgrid WebGIS
- Ausgrid for feeder load
- Photos



Weather & Feeder Requirements

Weather

- Design Wind Pressures (see NS220)
- Geography of design location
- Microburst (Downdraft)

Feeder Requirements

- Provided by Ausgrid:
 - Conductor type & size
 - Feeder rating (in Amps)
 - Maximum operating temperature (eg, historical, future, etc).

Modelling

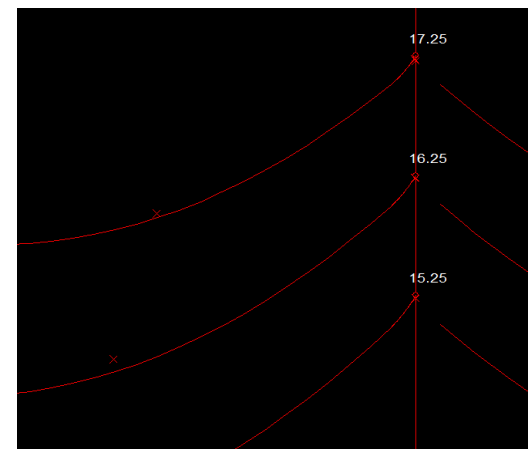
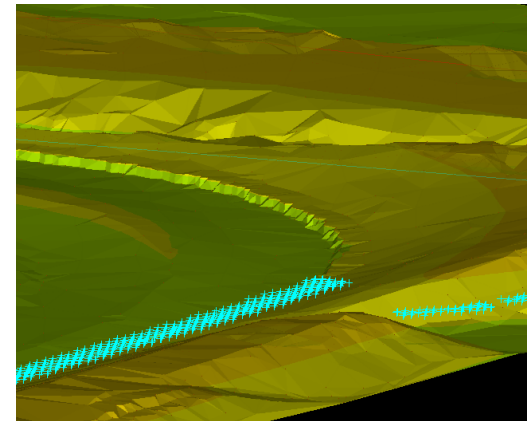
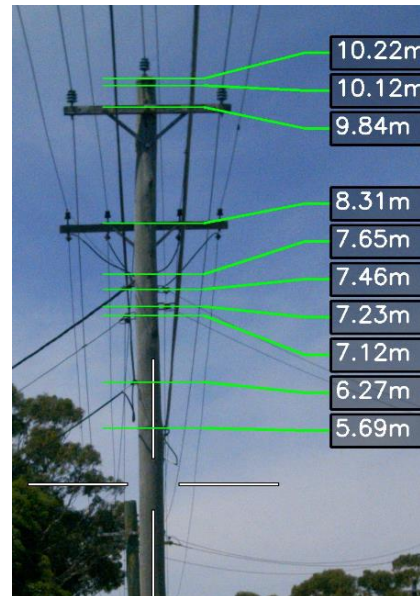
More like this:

Software Model

- Finite Element Analysis tool:
 - PLS-CADD
 - TL-Pro.
- Material Analysis:
 - Material Properties & Strength Factors.

Using Survey Data

- Terrain
- Conductor shots
 - Temperature
 - Calculate existing tension
- Poles & Hardware
 - Height out-of-ground
 - Attachment Heights



Modelling

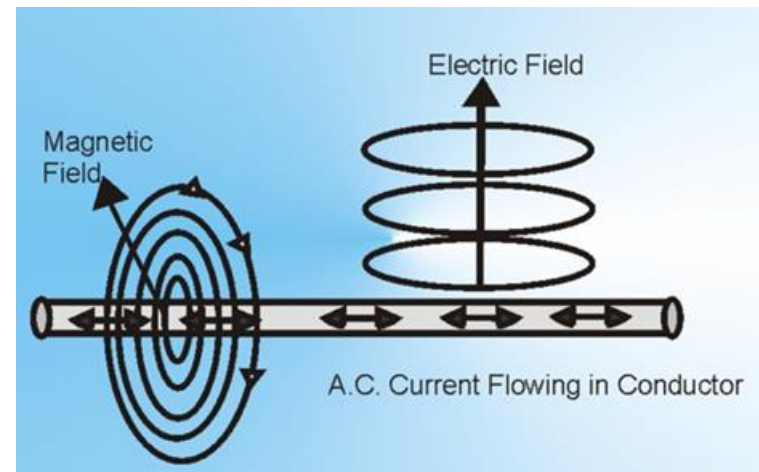
EMF / Community Impacts

Electromagnetic Fields

- Sensitive Receivers
- Potential impact on Receivers
- Analysis

Community

- Community Consultation
- Painting of structures
- Timing of construction activities



Modelling

Design Clearances

Circuit-to-Circuit Separation on the same support

- Highest voltage at pole top, followed by lower voltages
- Refer to table in NS220

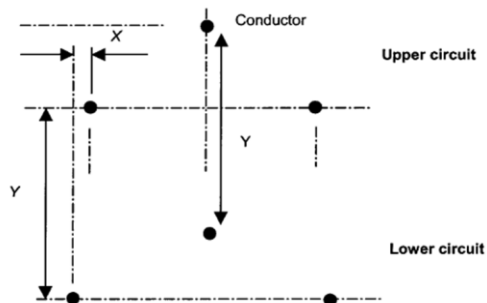
Mid-span separation

- Equations 3.1 & 3.2 from AS/NZS 7000:

$$\sqrt{X^2 + (1.2Y)^2} \geq \frac{U}{150} + k\sqrt{D + l_i}$$

where

$$U = \sqrt{V_a^2 + V_b^2 - 2 \cdot V_a \cdot V_b \cdot \cos\theta}$$



and $k = 0.6$ for Subtransmission feeders

(other factors are as per AS/NZS 7000)

Mid-span separation is checked with conductors at 50°C (no wind)

Modelling

Design Clearances

Circuit-to-Circuit Separation on the same support (continued)

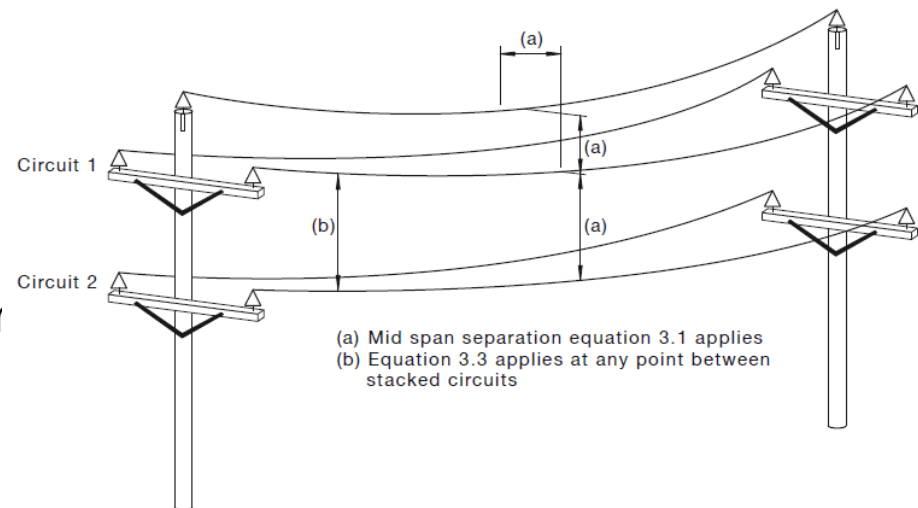
At any point in the span (vertically)

- Equation 3.3 from AS/NZS 7000:

$$(b) > (0.38 + q (U - 11))$$

This check is done at:

- 50°C (no wind); and
- Upper circuit at maximum operating temp. and Lower circuit at ambient temp. (15°C).



Modelling

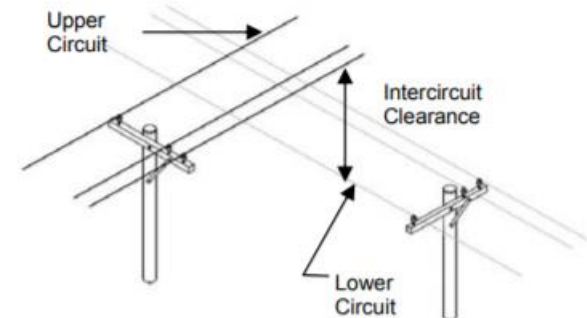
Design Clearances

Circuit-to-Circuit Separation for Unattached Crossings

- *No Wind* – Upper circuit at maximum operating temp. and Lower circuit at ambient temp. (15°C)
- *Wind* – Blowout conditions (40°C and 500Pa)
- Dynamic Loading clearance ('double envelope' method; both at max. temp.)

13.2.4 Unattached conductor crossings

		Upper Circuit								
		66kV – 132kV bare	>33kV – 66kV bare	33kV bare or covered	11kV - 33kV insulated	11kV, 22kV, 12. 7kV SWER bare or covered	LV bare, covered or insulated	Other cables – conductive	Other cables – non-conductive	
Lower Circuit		m	m	m	m	m	m	m	m	
	66kV – 132kV bare	No wind	3.0							
		Wind	1.5							
	>33kV – 66kV bare	No wind	3.0	2.5						
		Wind	1.5	0.8						
	33kV bare or covered	No wind	3.0	2.5	2.0					
		Wind	1.5	0.8	0.5					
	11kV - 33kV insulated	No wind	3.0	2.5	2.0	2.0				
		Wind	1.5	0.8	0.5	0.4				
	11kV, 22kV, 12. 7kV SWER bare or covered	No wind	3.0	2.5	2.0	2.0	1.5			
		Wind	1.5	0.8	0.5	0.4	0.5			
	LV bare, covered or insulated	No wind	3.0	2.5	2.0	2.0	1.5	1.0		
		Wind	1.5	0.8	0.5	0.4	0.5	0.4		
	Other cables – conductive	No wind	3.0	2.5	2.0	2.0	1.5	1.0	0.6	0.4
Wind		1.5	0.8	0.5	0.4	0.5	0.4	0.4	0.2	
Other cables – non-conductive	No wind	3.0	2.5	2.0	2.0	1.5	1.0	0.6	0.4	
	Wind	1.5	0.8	0.5	0.4	0.5	0.4	0.4	0.2	

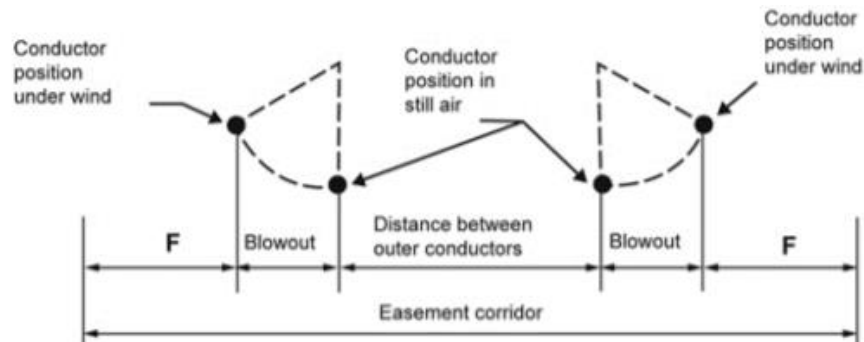


Modelling

Design Clearances

Blowout

- *Temperature:* 40°C
- *Wind Pressure:* 500Pa (approx. 102km/h)
- Check:
 - Easement
 - Property Boundary.



HORIZONTAL CLEARANCE BETWEEN CONDUCTORS AND EASEMENT BOUNDARIES

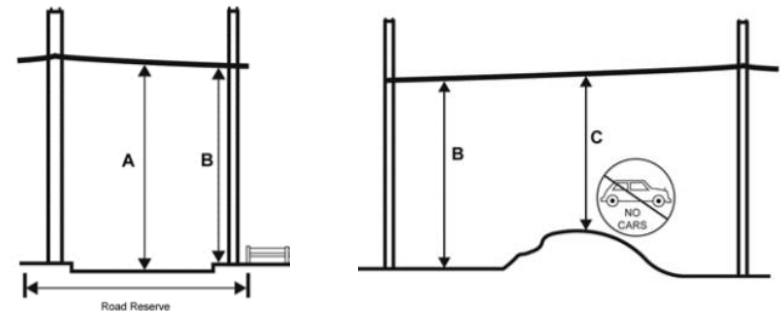


Modelling

Design Clearances

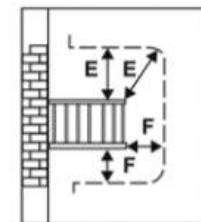
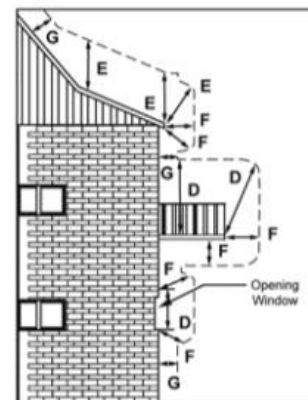
Ground Clearance

- Maximum Operating Temperature
- Road reserve
 - Consider High-Load traffic areas



Structures

- Maximum Operating Temperature
- Blowout
- Everyday



These dimensions apply if the height of the railing (or similar) plus distance E is greater than distance D

Modelling

Pole Loading Calculations

Load Cases for Subtransmission Design

- Maximum Wind (Ultimate Strength)
- Everyday (Sustained)
- Failure Containment
- Maintenance / Construction
- Microburst (Downdraft)

Accuracy

- Check:
 - Embedment depths
 - Attachment heights
 - Material parameters
 - Cross arm material and size.
- How does your line design software break conductors (Failure Containment)

Modelling

Pole Loading Calculations (continued)

Analysis

- Understand the line design software's report – don't just look for the %
- Consider pole deflection, insulator swing, etc.

Future pole loading

- OPGW or phase conductor upgrade
- Tee-off to a future customer
- Need for a construction stay (on-pole, and surrounding ground)?
- Model the future arrangement. We will ask you for this!

Modelling

Foundation Design

Gather data

- Site visit
- Borehole / CPT
- Ausgrid GIS Soil Map

Analyse

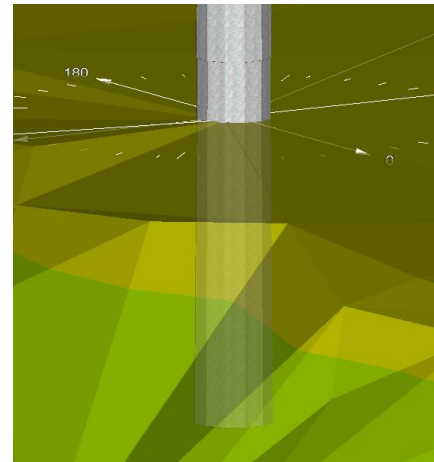
- Pole Embedment Calculator (PEC)
- Specialist Geotechnical Engineer

Confirm

- Work with ASP/1 to ensure soil encountered is as per Design

Information

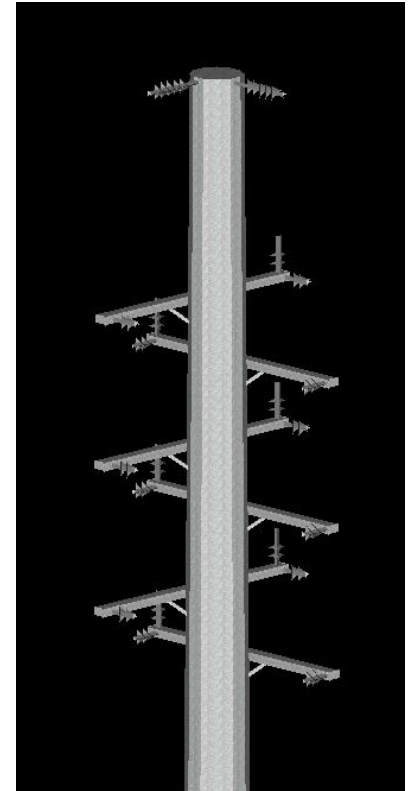
- Gather geotechnical data at critical parts of the feeder
- Consider construction activities, eg UGOHs, one-way terminations
- Consider future pole loading requirements



Samples & Tests	Depth / (RL) metres	Graphic Log	USC Symbol	
D			-	Sand
	0.30		-	CLAY
D				
SPT 3/7/9 N=16				
D				
	1.30		-	CLAY indur.

NS181 – Network Standard Variations

- Use Standard Constructions where possible
- When this is not possible, there is an alternative, See NS181
- Application to Asset Engineering Policy & Standards group for review. They will assess:
 - Your justification why Standard Constructions aren't suitable
 - Your electrical clearance checks, insulation coordination study & other design checks
 - Consideration of construction & (future) maintenance activities
 - Materials availability & potential impact on Ausgrid Store system
 - Application of Safety in Design principles
 - etc.
- Submit your NS181 application along with the supporting evidence
- Receive feedback



Safety-in-Design (SiD) & Constructability

Safety - it's everyone's responsibility!

- SiD is a WHS Act 2011 requirement
- Safety is THE #1 priority for Ausgrid!
- Understand the purpose of the structure you are designing
- Phases to consider:
 - Construction
 - Maintenance
 - Decommissioning.
- Consultation (eg, meetings, workshops, etc)
- Submit your SiD report

Constructability

- How will the ASP/1 build my design?
- Staging, construction stays, pole design for one-way terminations, etc



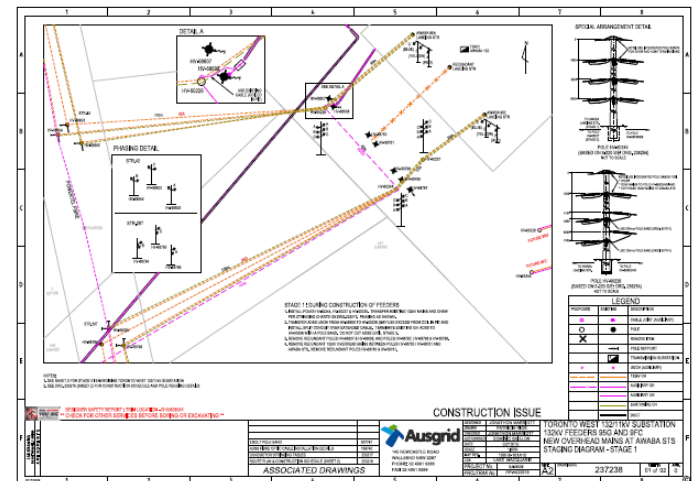
Peer Review & Construction Plans

Peer Review

- Peer Review your model / plans / ideas

Construction Plans

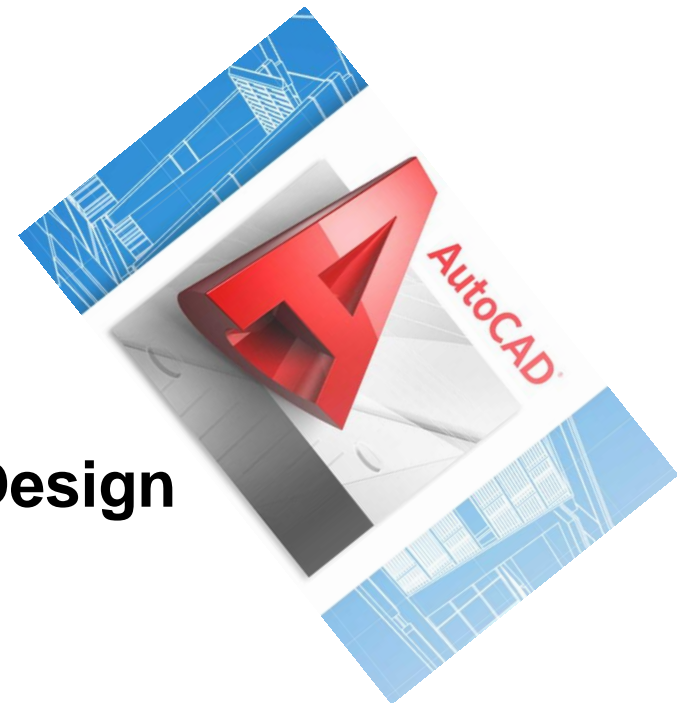
- Compliance with NS104 (as a minimum)
- Construction plans match your Line Design model (eg, pole sizes)
- Phasing arrangement (eg, transpositions)
- Staging comments or diagrams
- Additional comments required for construction support
- NS181 details (if required)
- As-built drawings



Subtransmission O/H Design Philosophies

Summary

- Introduction
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 - Design Clearances
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- NS181 – Network Standard Variations
- Safety-in-Design (SiD) & Constructability
- Peer Review & Construction Plans



AutoCAD and NET CAD External Design Template

Max Labecki
Design Management



AutoCAD and NET CAD External Design Template

AutoCAD

- 2018 (Default File format AutoCAD 2018 .dwg)

NET CAD External Design Template

- New version being released early 2019.
- Features being added to the design template include:
 - Updated symbology.
 - Addition of new Blocks for LV Schem symbols and LV HDPE cable and corresponding layer.
 - Updated notations to be placed on the design.
 - Autofill function for certification number.
 - Review and consolidation of some design Table data.



**Thank
You!!!**

www.thebodytransformation.com

Wishing you all a
Merry Christmas and a
Happy New Year