

Guidelines for developers of subdivisions and electricity infrastructure

NP020 – June 2026

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Version control

Revision	Issue date	Status	Approved by
A	14/11/2016	Final	Power Networks – Chief Engineer
B	July 2026	Final	Power Services – Senior Manager Network Planning and Design

Table 1: Version control

1. Introduction and overview

1.1 Purpose

The purpose of this document is to provide distribution developers with comprehensive guidelines for navigating the connection lifecycle. This document serves developers, electrical consultants, and contractors involved in land subdivision and electricity infrastructure development projects in the Northern Territory.

These guidelines establish the mandatory requirements, processes, and responsibilities for connecting new developments to Power and Water's electricity distribution network, covering the complete process from initial application through to asset handover and ongoing operations.

These guidelines are subject to regular review. It is necessary that proponents obtain the up-to-date version located on Power and Water's Power Development webpage prior to submitting a connection application or enquiry.

1.2 Scope

These guidelines are applicable only to those areas of the Northern Territory which are:

- serviced by existing electricity distribution networks under the direct control of Power and Water;
or
- new electricity extensions to existing distribution networks to be taken over by Power and Water.

For supporting technical information, this document should be read in conjunction with the reference documents identified in Table 2.

2. Regulatory framework and responsibilities

2.1 Regulatory framework

2.1.1 Related Power and Water documents

For more information on Power and Water’s network requirements, see Table 2 below. These will apply to all connections to the Power and Water electricity network.

Document title	Record number
Meter Manual	NP010
High Voltage Electricity Network Master Plan Guidelines	NP014
Electricity Demand Planning: Customer Capacity Allowances (kVA)	NP016
Service and Installation Rules	NP018
Easement Guidelines	NP021
Construction and Connection of Streetlight Assets	NP027
Guidelines for Electrical Design Consultants	NP041

Table 2: Power and Water reference documents

2.1.2 Legislation and regulation

The relevant legislation and regulations listed in Table 3 below will apply to the design, manufacture, installation, testing and commissioning, and operations and maintenance of all plant and equipment for connection to a Power and Water network.

In the event there is any inconsistency between legislation and regulations and these guidelines, the legislation and regulations shall prevail.

Instrument name	Instrument type
National Electricity (NT) Rules	Regulation
Electricity Reform (Safety and Technical) Regulations 2000	Regulation
Network Technical Code	Code produced under Electricity Reform (Administration) Regulations
System Control Code	Code produced under Electricity Reform (Administration) Regulations

Table 3: Legislation and regulations

2.2 Rights and responsibilities

This section provides a summary of the rights and responsibilities of each party in achieving a connection service to a new power development or subdivision. More detail on the process and accompanying requirements can be found throughout this document.

A detailed description of the rights and obligations of both the developer and Power and Water when entering into a connection agreement can be found in the General Terms and Conditions of the Power Services Negotiated Connection Agreement, available on Power and Water's [Negotiated Connections](#) webpage.

2.2.1 Developer's rights and responsibilities - General

- a. the developer must provide all relevant information to Power and Water that may reasonably be required to meet its obligations in delivering the connection service.
- b. the developer shall submit a negotiated connection application form and any relevant supporting information to Power and Water outlining the proposed subdivision or development activity. The negotiated connection application form and associated guideline, along with a list of accredited electrical contractors and design consultants and other information is available on Power and Water's [Power Connections](#) webpage. The form can be submitted online, or via email to Connection.PWC@powerwater.com.au.
- c. the developer must notify Power and Water of any hazards or risks to safety and, as soon as reasonably practicable, any matter or thing that could reasonably be expected to impact in a material way the nature, cost or timing of any aspect of the connection service.
- d. the developer must ensure that all information provided to Power and Water is true and correct.
- e. the developer shall ensure that electrical developments are designed and constructed by accredited electrical consultants and contractors. A list of current accredited electrical contractors along with the Power and Water Power [Approved Materials List](#) is available on Power and Water's [Power Development webpage](#).
- f. the developer must ensure that all electrical installations and other equipment proposed to be installed on the developer/customer side of the point of supply is appropriate for its intended purposes. Power and Water does not make any assessment of these matters or provide advice as to these matters.
- g. the developer has a right to apply for a new connection or upgrade of connection to Power and Water's infrastructure where it complies with current Power and Water standards.
- h. the developer shall carry out all necessary preliminary work identified and satisfy any necessary pre-conditions identified in the Negotiated Connection Agreement.
- i. the developer shall provide safe and unhindered access to the premises and surrounding land as required and protect from harm any items or equipment installed as part of the connection service.
- j. the developer shall ensure compliance with all safety and technical requirements, including relevant legislative obligations, Australian Standards and technical codes and any other reasonable requirement made by Power and Water in relation to undertaking the connection work.
- k. for installed electrical infrastructure gifted or transferred to Power and Water, the developer is to provide a warranty covering workmanship and defects for 2 years.
- l. where there are existing low voltage mains from which supply can be made available with no immediate requirement for network upgrade work, service connection charges will apply as per Power and Water's [Connection Policy](#).
- m. the developer shall identify, establish, survey and grant to Power and Water any easements to the relevant land prior to commissioning of the connection works.

- n. the developer must pay the connection charge for the connection service, and any other applicable charges, by the due date as set out in the Negotiated Connection Agreement.
- o. where required, the developer must provide a security for the amount specified in the Negotiated Connection Agreement by the specified date.

2.2.2 Developer's rights and obligations - Subdivisions

- a. to subdivide land into 2 or more lots, a subdivision application must be lodged with the Development Consent Authority (DCA). The subdivision layout and appropriate zoning of each newly created lot shall be submitted. All newly created lots in a subdivision layout shall have public road frontage for electricity service connections. Electricity supply service to any lot through another lot is strictly prohibited.
- b. the developer shall be responsible for the applicable costs (design, installation and shared network contribution) of providing a basic power supply or known maximum demand to each new zoned lot in urban areas, rural areas or industrial/commercial areas and bear the cost of connection to the existing electrical distribution system. The developer will provide all reticulation intended for handover to Power and Water, including extensions into battle axe lots where applicable.
- c. the developer shall provide survey plans and register appropriate electricity easements for overhead power lines, underground cables, distribution fused pillars and substations on newly created lots to the Land Titles Office at no cost to Power and Water. Details of various electricity easement requirements and conditions of use are in accordance with Power and Water's publication, 'NP021 - Easement Guidelines'.
- d. axe-handled and battle-axe-handled lots are not recommended in any new subdivision and are not permitted in urban subdivisions, as they will incur much higher costs in installing customers' internal reticulation to meet an acceptable voltage drop for appliances to properly function. Where the developer wishes to proceed with axe-handle or battle-axe-handled lots, the additional requirements below shall apply to the connection(s):
 - for axe-handled lots with an access road up to 200m long, a suitable substation shall be installed at the front boundary.
 - for battle-axe or axe-handled lots with an access road more than 200m long, high voltage power line extension and a suitable substation shall be installed. A 10m wide electricity easement covering the full length of reticulation and establishment of an all-weather access road capable of taking the weight of a 15-ton service vehicle for Power and Water to carry out operations and maintenance of the power line within the axe/battle-handled access.
- e. when subdividing an existing serviced lot with current multiple power services, any overhead or underground electricity supply crossing the new property boundaries must be satisfactorily removed/disconnected prior to a power clearance being issued by Power and Water.
- f. the responsibility for providing street lighting rests with the road owner. Where the developer is required to provide street lighting as part of a subdivision, approval of a specific street lighting category requirement must be sought from the road owner. Approval by Power and Water of a street lighting drawing refers only to the electrical design and compliance to standard fittings for suitable operations and maintenance purposes.

Refer to NP027 - Construction and Connection of Streetlight Assets on Power and Water's [Design and construction guidelines](#) webpage for more details.

2.2.3 Power and Water's rights and responsibilities

2.2.3.1 Negotiated connection application

Upon receipt of a [negotiated connection application form](#) for a development activity, Power and Water shall:

- review the application for completeness and request any additional information required within 10 business days
- within 20 business days after the receipt of a completed application for a connection service, request any additional design information required to properly assess the application.

2.2.3.2 Network capacity requests

Where the developer requires a network capacity assessment (large loads on a regulated network, all loads on unregulated networks), Power and Water shall:

- review the request for completeness and request any additional information required within 10 business days
- if a load increase investigation is required, provide a quote to the developer
- if the quote is accepted, undertake a load increase investigation
- prepare an assessment response for the developer.

Note - A network capacity assessment may be required for smaller loads where the developer proposes to connect to weak areas of the network e.g. long rural feeders.

2.2.3.3 Design review

Following approval of a high voltage connection (loads >250kVA) by Demand and Network Planning and submission of electrical detailed design drawings, Power and Water shall:

- review and approve the electrical detailed design submission for construction
- provide a Letter of Information to the developer outlining the next steps, requirements and obligations of the developer in progressing the development activity.

2.2.3.4 High voltage network upgrade

Where it is identified during the network capacity assessment that a high voltage network upgrade is required to meet a development's overall maximum demand requirements, Power and Water may:

- determine the shared network (upstream of the connection point) upgrade requirements
- determine the customer connection point and where needed upgrade requirements to support the requested load
- prepare a design quote for the power upgrade
- after acceptance of the quote, carry out the detailed design work
- advise the developer on the construction period and anticipated project completion date.

2.2.3.5 Negotiated connection offer

Upon approval of electrical detailed design (low and high voltage) and completion of any necessary high voltage network upgrade,

Power and Water will:

Prepare a Negotiated Connection Agreement (NCA), including:

- calculating capital contribution,
- final connection costs,

- identification of any security fee where applicable, in accordance with Power and Water’s Connection Policy and the current Network Pricing Proposal (available on Power and Water’s website).

2.2.3.6 Gifted asset construction and handover

Following commencement of construction, Power and Water shall:

- undertake reasonable quality assurance auditing of the works in accordance with the inspection and test plans
- receive and review all required handover documentation from the developer on completion of the works
- issue a power clearance letter to the Development Consent Authority when the developer satisfactorily meets all requirements
- plan, schedule and execute the final electrical connection.

3. Connection process overview

3.1 Connection types

Power and Water provides 3 processes for connection to the Northern Territory electrical distribution network: Basic, Negotiated, and Major connections (Figure 1). Additional details are available on the Power and Water [power connections](#) webpage.

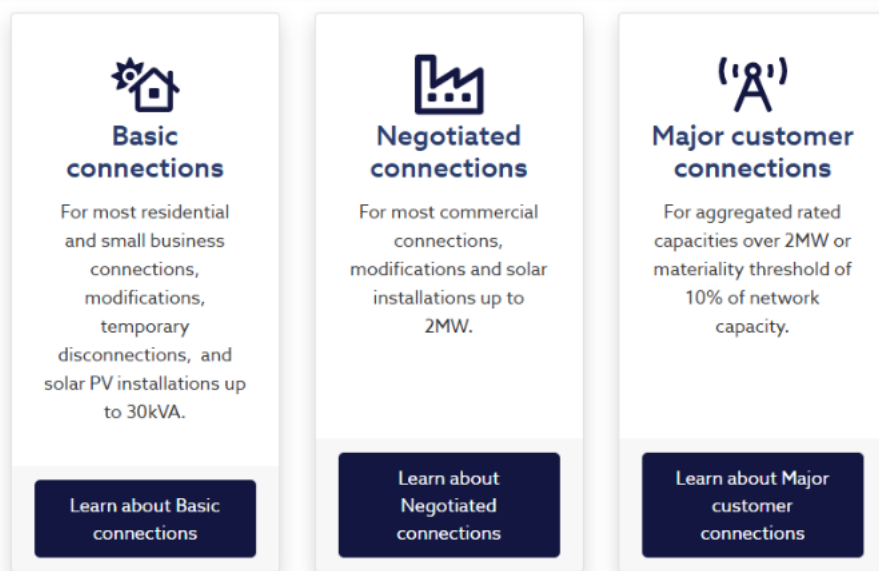


Figure 1: Three connection processes, Basic, Negotiated and Major - refer to the Power and Water power connections webpage

For detail on the different connection services and associated fees and charges see Power and Water’s [Connection Policy](#).

In general, basic connection services include connection of residential and small non-residential premises where:

- supply is available (i.e. there is a power asset (overhead or underground) at the required voltage and with sufficient capacity for the proposed connection);
- no network augmentation is required;
- the maximum demand of the electrical installation is less than or equal to 100 Amps per phase.

3.2 When negotiated connections apply

Negotiated connection services become necessary when projects exceed the scope of basic connections or when applicants require specific contractual arrangements. This process typically applies to subdivisions, real estate developments, commercial connections where network augmentation is required, and embedded generation systems larger than 10kVA for single-phase or 30kVA for 3-phase installations. Projects requiring dedicated substations, high voltage feeders, or significant network augmentation also fall under this category.

Negotiated connection services are those connection services that do not meet the definition of a basic connection service.

Connections to a real estate development and/ or subdivisions are considered negotiated connection services.

3.3 Negotiated connections process

The negotiated connection process follows a structured 6-stage framework designed to ensure thorough assessment while managing project risks and costs effectively. An overview of this process is shown in Figure 2 below.



Figure 2 General Overview of the 6 staged Negotiated connection process

The negotiated connection process stages consist of:

1. **Enquiry** – For requests for information or connection process enquiries related to the negotiated connection process. See contact details from Power and Water’s power connection webpage below (Figure 3).

Connection related enquires

Our Customer Service Centre can help with information about our connection services

Phone: 1800 245 092 or email us at connect.me@powerwater.com.au

Our Developer Services team can assist with technical queries and status of applications. They will be in contact with the applicant within 5 business days of receiving the application.

Email: connection.pwc@powerwater.com.au

Figure 3: Connection related enquiry contact information – refer to Power and Water’s power connection webpage.

2. **Application** – Submission of the negotiated connection application. Power and Water assigns a dedicated Design Officer who serves as the primary technical liaison throughout the design development and approval process. For more information refer to Power and Water’s [power connections webpage](#).
3. **Planning** – Applies only to projects with large maximum demand and involves conducting preliminary and detailed network impact studies and modifications to the high voltage master plan, refer to NP014 - High Voltage Electricity Network Masterplan Guidelines for more information. Projects below this threshold proceed directly to the design stage.
4. **Design** – This stage encompasses 2 distinct processes: the Gifted Asset Process where developers design, build, and transfer all new network high voltage and low voltage power assets to

Power and Water, and the High Voltage Upgrade Process where Power and Water manages the design and construction of necessary network augmentation on existing power assets.

5. **Offer** – On approval of the detailed connection design drawings Power and Water provides a formal connection offer in a negotiated connection agreement. This includes full cost estimates for the connection, detailed connection agreement terms, specified technical requirements and agreed access standards.
6. **Construction** – Involves capital works construction, implementation of the inspection and test plan (ITP), commissioning, and provides handover document compliance.

Notes:

- I. Power and Water shall endeavour to respond to negotiated connection enquiries within 10 business days.
- II. Power and Water shall endeavour to provide a connection offer within 65 business days from the date the connection application is submitted. This offer timeframe is not inclusive of days Power and Water is waiting for the proponent to respond to requests for information or clarifications on details within the application.
- III. The connection date is as scheduled in the connection agreement; however, this may vary depending on the complexity of the project and any delays to the construction schedule may impact the final connection date.

See Stage 5 - Offer (negotiated connection agreement) for more information on fees and charges associated with negotiated connections.

4. Stage 1 - Enquiry

4.1 Enquiry

When planning a development project, developers are encouraged to submit an initial enquiry to Power and Water's Connection Concierge team via email to connection.pwc@powerwater.com.au outlining the proposed development and seeking confirmation on any additional assessments that may be required for the specific project.

As defined in Power and Water's [Connection Policy](#), connection services for real estate developments are deemed *negotiated connection services*. Further information on the negotiated connection service enquiry process can be found at Power and Water's [Negotiated Connections](#) webpage.

5. Stage 2 - Application

5.1 Negotiated connection application

The negotiated connection application is the primary information transmittal from the developer to Power and Water. While only the development location and anticipated maximum demand for the full development are mandatory, the more information that can be provided, the more accurately and quickly Power and Water can respond.

Key inputs to the negotiated connection application are the high voltage connection assessment and proposed loads over time. A pre-feasibility or capacity assessment request may also be necessary, as determined during the enquiry stage.

The negotiated connection application form is available from Power and Water's [Negotiated Connections](#) webpage and requests the following information to be included:

- overall development estimated load
- individual stage estimated load
- staging time frames
- type of loads (residential/commercial/industrial)
- number of lots (including lot numbers if available)
- AS/NZS 3000 calculations used to estimate maximum demands
- conceptual development/subdivision drawings (showing the area with lot details).

6. Stage 3 – Planning

This stage applies only to projects with large maximum demand (generally >250kVA total demand) and involves conducting preliminary and detailed network impact studies and modifications to the high voltage master plan. Projects below this threshold proceed directly to Stage 4 - Design.

Note – As highlighted in section 2.2.3, a network capacity assessment may be required for smaller loads where the developer proposes to connect to weak areas of the network e.g. long rural feeders.

6.1 High voltage electricity network masterplan guideline (NP014)

To ensure capacity is available in regulated networks for future developments, the developer must adhere to NP014 - [High Voltage \(HV\) Electricity Network Masterplan Guideline](#).

The intent of the High Voltage (HV) Electricity Network Masterplan Guideline is to help developers ensure that:

- the completed development shall be compliant with both Power and Water's standards and wider industry codes and standards
- consistent information is available in a standard format for all electricity assets required to be installed on the network
- the new development does not hinder the provision of supply to neighbouring developments
- the masterplan is approved in an efficient manner so that the wider future planning needs of the surrounding distribution network can be met.

The high voltage master plan approval is a critical step in the Negotiated Connection Agreement (NCA) application and approval process. To guarantee capacity for a development, an approved NCA is required and guarantees supply, through a commercial agreement between Power and Water and the developer for the demand set out in the NCA.

A high voltage master plan must cover the entire scope of the development, including all proposed stages if it is planned to be built in separable stages over multiple years. However, a developer may opt to apply for an NCA for an individual stage of the development, multiple stages or the full development.

The High Voltage(HV) Masterplan Guideline should be applied in line with the NP016 - [Electricity Demand Planning: Customer Capacity Allowances \(kVA\)](#) report which will provide guidance on the demand values that should be used by developers and electrical consultants when calculating load requirements.

6.2 Demand planning

Power and Water's NP016 - [Electricity Demand Planning: Customer Capacity Allowances \(kVA\)](#) and NP012 - [Electricity Demand Planning: Indigenous Essential Services and Minor Centres Customer Capacity Allowances \(kVA\)](#) documents summarise the outcomes of customer demand analysis for the purpose of planning future demand of Power and Water's high voltage network. Customers have been grouped into common categories and the associated maximum demand to be used for network planning of the high voltage network has been specified for each category.

The values provided in electricity demand planning documents are not to be used for planning and design of the low voltage network but will form the basis for planning activities within Power and Water's networks by providing updated demand values and estimate methodologies for developers when forecasting the required load on the HV network for new connections.

For general design information relating to existing electrical distribution networks under the direct control of Power and Water, and development of new electricity extensions to the existing distribution networks to be taken over by Power and Water, see NP041- [Guidelines for Electrical Design Consultants](#).

7. Stage 4 - Design

7.1 Design process and approval

7.1.1 Developer's representative (project manager)

The developer may act for themselves in directly dealing with Power and Water or employ a project manager to act as their representative for the development.

The developer shall advise Power and Water in writing of the name and contact details of the representative and of any subsequent changes.

Any correspondence, discussion, direction, or matter made with or within the knowledge of the project manager shall be deemed to be within the knowledge of the developer.

7.1.2 Design review

Following approval of a high voltage connection assessment (loads >250kVA in urban areas) and submission of electrical detailed design drawings, Power and Water shall:

- assign a Works Management Planner to the project
- review and approve the electrical detailed design submission for construction
- provide a Letter of Information to the developer outlining the next steps, requirements and obligations of the developer in progressing the development activity
- provide an offer to the developer to undertake the connection services (see section 8).

7.2 Technical design criteria

The information provided in this section is to guide the developer and their design consultants on the minimum network design requirements in various locations and project scenarios. Early engagement with Power and Water on the specific requirements associated with your project is critical.

7.2.1 Minimum requirements in some areas

Some locations within Power and Water's regulated networks have specific minimum requirements that developers must ensure they are aware of and adhere to. This is particularly relevant for developments within central business district (CBD) locations, as defined in Table 4 below:

Name	Geographical location
Darwin CBD	Defined by the streets of Daly, McMinn, and Stokes Hill Road and includes the Darwin Waterfront Precinct.
Palmerston CBD	Defined by the streets of University Avenue, Chung Wah Terrace, Temple Terrace and Roystonea Ave, including the Oasis shopping village and Palmerton shopping centre
Katherine CBD	Defined by the streets of O'Shea Terrace, Railway Terrace, Chambers Drive and Fourth Street.

Name	Geographical location
Alice Springs CBD	Defined by the streets of Wills Terrace, Leichardt Terrace, Stott Terrace and the Stuart Highway.

Table 4: Central business district geographical locations

Specific minimum requirements in CBD locations may include, but not be limited to:

- standard high voltage conductor type and size (e.g. 11kV requires 400mm² aluminium)
- permanent concrete pits for all cable joint pits (outside of tunnels), turning pits/long radius conduit bends, pulling pits etc. and prohibiting sand pits/temporary pits in these areas.

Minimum technical requirements are defined in Power and Water’s Standard Drawings. Contact Power and Water for details on the specific minimum technical design requirements for your project.

7.2.2 Electricity supply at high voltage

The following requirements on high voltage installations are provided here to ensure the developer is made aware early of relevant requirements applicable to a project. Further detail can be found in Power and Water’s NP018 – Service and Installation Rules.

- a. Power and Water shall consider provision of 11kV or 22kV (depending on current distribution network voltage in the area) to customers on a case-by-case basis subject to assessment consideration on the customer:
 - connected load being more than 4.5MVA (3 x 1.5MVA transformers) at the available low voltage point of supply on one property
 - having one development over several lots without a land consolidation application
 - having suitable access restrictions or security restrictions on the property
 - having multiple transformers at various locations over a large area of land.
- b. high voltage customers shall design, construct, own and maintain an intake station building at an agreed, accessible position close to the front property boundary to house the required incoming and outgoing high voltage switchgear operated by Power and Water. Where it is not practicable to establish the intake station building, Power and Water may consider pole-mounted high voltage switchgear in overhead areas for high voltage customers.
- c. high voltage customer’s owned power assets are from the Power and Water 11kV/22kV outgoing point of supply i.e. isolator switchgear in the case of having an intake station, or auto-recloser in the case of pole-mounted switchgear in overhead areas.
- d. high voltage customers’ power assets shall comply with all relevant Australian Standards, typically AS/NZS 3000 Wiring Rules, AS 2067 Substations and high voltage installations exceeding 1kV A.C.
- e. high voltage customers’ electricity network installations must not be connected to Power and Water’s 11kV/22kV outgoing point of supply before submitting:
 - signed copy of NT WorkSafe – Certificate of Compliance (CoC) by the electrical contractor
 - signed copy of engineering consultant’s certification report that includes specific details of locations, high voltage power assets being installed, inspected and tested in accordance with applicable Australian Standards for the purpose of final connection works.

- f. the minimum fault levels for equipment connected to Power and Water's network must be in accordance with the Network Technical Code.
- g. protection relays, current transformers, voltage transformers and other protective equipment must have characteristics to suit Power and Water's existing protection system. Similarly, a customer's protection device must be compatible with upstream network protection assets and isolate during the fault without affecting Power and Water's distribution system.
- h. a detailed protection report must be submitted to Power and Water with functional description, switchgear configuration, protection single line diagrams, fault levels, protection relay settings, coordination graphs, and other requirements as mandated in the negotiated connection agreement.
- i. the protection design must comply with IEC 60255, IEC 61000, appropriate Australian Standards and industry best practice.
- j. the high voltage customer is also responsible for the operation, testing and ongoing maintenance of the high voltage installation in accordance with current Australian Standards practice.
- k. the high voltage customer must co-ordinate and seek approval from Power and Water before modifying protection settings or schemes on their main incoming circuit breaker protection in the case of having an intake station.
- l. facilities must be provided for the disconnection of all high voltage and protection circuits.
- m. the high voltage customer's internal electricity supply systems must comply with Power and Water's Network Technical Code.
- n. high voltage customers who intend to install or add to a high voltage installation for any additional load connection shall submit a proposal to Power and Water for network capacity assessment and await a reply in writing before proceeding with the ordering of equipment.
- o. the high voltage customer's electricity operations must be operated to comply with requirements of the network System Controller.
- p. all high voltage installations must be regularly maintained in good order, so that it will perform the functions for which it was designed. AS/NZS 2650:2000 'Common specifications for high-voltage switchgear and control gear standards' is relevant in this regard.

7.3 Development type requirements

7.3.1 Urban residential developments

7.3.1.1 General requirements

Electricity reticulation extension in new urban residential areas shall be underground in major town centres (Darwin, Palmerston, Katherine, Tennant Creek, and Alice Springs) as per Power and Water's [Standards Manual Volume 2](#).

7.3.1.2 Basic supply

The developer shall be responsible to provide the basic supply or known maximum demand to each of the newly created lots in the subdivision/development based on their specific zoning:

- a. 10kVA single phase for single dwelling lot (zoned SD, Single Dwelling or equivalent) with service cables installed

- b. 22VA per m² 3 phase for duplex or unit lot (zoned MD, multiple dwellings or equivalent) with service cables installed for up to 3 duplex/units. A fused distribution pillar without service cables, will be required for lot intended for more than 3 duplex/units
- c. 55VA per m² 3 phase for medium density flats (zoned MR, medium density residential or 4 floors) with a fused distribution pillar
- d. 88VA per m² 3 phase with a fused distribution pillar for maximum of 150kVA load and near an upgradable substation, or a suitable new substation location for high density flats (zoned HR, high density residential or 8 floors).

Where the power requirements of subdivided lots are unknown at the time of the development (e.g. zoned CBD or similar), Power and Water requires the developer to provide a legal servicing agreement and appropriate bank guarantee for the potential land buyer of each lot to develop specific infrastructure.

7.3.2 Rural residential developments

7.3.2.1 General requirements

In rural areas, electricity reticulation extension using overhead power lines (11kV or 22kV) is accepted by Power and Water as per [Standards Manual Volume 1](#). In specific cases where required by local Council, Power and Water does not object to the use of underground power reticulation to new residential subdivisions.

Electrical reticulation shall be required in connection of an unserviced lot including but not limited to:

- a. new lots less than 8 hectares unless they are considered too distant from the existing distribution network to be economically connected
- b. new lots larger than 8 hectares where the surrounding area is reticulated.

It is recommended developers confirm the electricity connection requirements of the local government area in which the project is located.

7.3.2.2 Basic supply

The developer shall be responsible to provide the basic power supply or known maximum demand to each of the newly created lots in the development or subdivision:

- a. 25kVA 3 phase for single dwelling lot (zoned rural residential RR, rural living RL or equivalent); or
- b. the agreed kVA for the specific development; or
- c. the anticipated power maximum demand figure determined in accordance with AS/NZS 3000.

7.3.3 Commercial and industrial developments

7.3.3.1 General requirements

- a. underground power services with specific load demand are required for new commercial/shopping centre development for public safety compliance.
- b. Power and Water prefers overhead reticulation be provided in new general industrial or light industrial developments as it is the most economical installation practice and easy to carry out augmentation works when required in future.
- c. the developer shall provide underground reticulation in a new development where the existing reticulation is underground. Adequate provision for future upgrade of the electrical system, without the

need for excavation will be discussed with and agreed by Power and Water. This means the provision of adequate conduits, high voltage cable loops, electricity easements for future substations and/or high voltage switchgear.

7.3.3.2 Basic supply

The developer shall be responsible for providing the basic 3 phase supply to each newly created lot (zoned GI - general industry or LI - light industry) with a minimum capacity as follows:

- a. 72kVA / 100A, 3 phase, or
- b. the agreed kVA for the specific development, or
- c. the anticipated power maximum demand figure determined in accordance with AS/NZ-3000 for lots zoned C – Commercial.

7.4 Special requirements and installations

7.4.1 Large customer with indoor substation

In developments with any of the following circumstances, an indoor substation is used instead of a typical package substation:

- highly valued central business district (CBD) areas
- maximum demand is greater than 1,000kVA
- proposed shopping/commercial centre or establishment with high pedestrian traffic (school; recreation centre; etc.)
- requirement for multiple transformer installation for greater security of power supply, or
- substation to be installed above or below ground level in a building.

For detailed requirements of indoor substations, in addition to that outlined below, see [NP041 – Guidelines for Electrical Design Consultants](#).

7.4.1.1 Indoor substation building location

The indoor substation building, and the customer's main switch room can be free standing or form an integral part of the premises. The indoor substation building needs to be located next to the customer's main switch room as unmetered customer's low voltage cables will not be permitted exceeding 15 metres to minimise electricity losses incurred by Power and Water.

In exceptional cases where unmetered customer's low voltage cables could not be installed within 15 meters from the point of supply in the indoor substation, the developer shall engage an electrical consultant to prepare a submission seeking Power and Water approval based on:

- selection of a suitable low voltage cable size to meet a maximum voltage drop of 0.5% on full load current
- appropriate installation method of the selected low voltage cables to be suitably connected to a low voltage circuit breaker inside the indoor substation building.

Any proposed low voltage cables must comply with Power and Water's standards. This ensures Power and Water or local suppliers will have reserves of suitable cables to replace or repair the low-voltage cables should any failure or damage occur over the lifetime of the connection. If exceptional circumstances apply and there are no standard cables suitable, the developer shall engage early in the connection process to evaluate the options prior to submitting designs to Power and Water..

Provision of unhindered 24 hour all-weather direct access to a proposed indoor substation location for Power and Water's heavy vehicles (up to 25 ton crane and 5 ton transformer) and safe personnel entry/exit access for construction, operations and maintenance works in both normal and emergency situations shall be complied with by the developer. Access through areas that are considered dangerous/hazardous or cumbersome to Power and Water's personnel are not acceptable.

It is essential that the immediate area around the indoor substation building is level and the maximum allowable slope of the access road/driveway to the indoor substation building is 1:10. Access route to the indoor substation building shall be a minimum width of 4 metres and 7 metres wide at the front area of the indoor substation and shall not be obstructed by parking vehicles, equipment storage space, site usage or any other impediments. If the developer plans to have a hangover above the indoor substation building, it must be at least 4 metres in height. Any access passage through a building from an indoor substation to such an area must be fire rated construction.

The developer, in consultation with the engaged accredited electrical consultant, shall be responsible for seeking approval from the Development Consent Authority (DCA) to meet the applicable active street frontage and 'provision for services' requirements.

The developer's building certifier must confirm in writing that in the event of a fire, the fire escape egress and evacuation corridor are not in the vicinity of the proposed indoor substation location as per fire services' compliance.

It is critical that the developer ensures safety clearance compliance between existing overhead power lines in the area and any proposed new building or extension during construction in accordance with the [Northern Territory Electrical Safety Regulations 2024](#). If any work is required on existing overhead power lines, the design and installation cost shall be borne by the developer.

It is strongly recommended that the developer arranges discussion with Power and Water to obtain an agreed suitable indoor substation location prior to submitting a formal application to the DCA. Failure to obtain a suitable indoor substation location agreed by Power and Water could result in additional costs and lengthy delays.

7.4.1.2 Indoor substation building size

The developer shall obtain written advice from an electrical consultant accredited by Power and Water for indoor substation design to provide the estimated maximum demand figure and make appropriate assessments in deciding correct orientation and suitable size of the proposed indoor substation building in accordance with AS/NZS 3000 and from the options listed below.

Indicative minimum dimensions shown only, exact dimensions are to be determined by the electrical consultant's specific design to ensure a safe minimum of 1000mm clearance provided from any structure to electrical equipment and a minimum of 900mm between equipment.

One transformer arrangement:

- option 1: 7,400mm x 5,000mm (to be confirmed by electrical consultant)
- option 2: 6,500mm x 6,500mm (to be confirmed by electrical consultant)
- option 3: 5,000mm x 6,800mm (to be confirmed by electrical consultant).

Two transformer arrangements:

- option 1: 10,700mm x 5,300mm (to be confirmed by electrical consultant)
- option 2: 10,000mm x 6,600mm (to be confirmed by electrical consultant)
- option 3: 7,900mm x 6,800mm (to be confirmed by electrical consultant).

Three transformer arrangements:

- option 1: 15,200mm x 5,000mm (to be confirmed by electrical consultant)
- option 2: 12,500mm x 7,200mm (to be confirmed by electrical consultant)
- option 3: 11,000mm x 7,500mm (to be confirmed by electrical consultant).

A suitable indoor substation building size option is assessed based on satisfactorily meeting all the following requirements:

- a. installed single or multiple transformers must have adequate capacity to satisfy the proposed development overall maximum demand figure and/or be capable of accommodating any planned future extension with minimal electricity supply interruption. A single transformer building must not exceed 1,000kVA in installed capacity and must satisfy the agreed reliability level of power supply between the customer and Power and Water.
- b. where the indoor substation building is to have multiple transformers, the transformers selected must be the same size and capable of supplying the whole load in the event of loss of one transformer, to meet N-1 reliability supply criteria requirement.
- c. proposed incoming and outgoing high voltage cable routes must have no more than one 90-degree bend to the building in relation to existing high voltage distribution network in the road reserve.
- d. proposed customer's low voltage mains cable routes must consider ongoing high voltage equipment maintenance requirements within the indoor substation building.
- e. suitable entry/exit doors of the indoor substation building in relation to immediate surrounding areas of the proposed development allow Power and Water's personnel access in normal and emergency situations.
- f. suitable 24 hour all-weather access for Power and Water's heavy vehicle movements in relation to immediate surrounding areas of the proposed development.
- g. no structural columns of any material are allowed inside the indoor substation building.

It is strongly recommended that the developer obtains a suitable indoor substation building option competently assessed by the electrical consultant prior to submitting a formal application to the DCA. Failure to obtain a suitable indoor substation building option agreed by Power and Water could result in additional costs and lengthy delays.

7.4.2 Indoor transformer type

Appropriate secure housing for transformers shall be provided in accordance with the requirements outlined in [NP041 – Guidelines for Electrical Design Consultants](#) for the following arrangements:

7.4.2.1 Ground level indoor substation

- standard oil type transformer(s) shall be installed in ground level indoor substation.
- indoor substation building shall be minimum height of 3 metres.
- Power and Water has various detailed options and standards drawings applicable to ground level indoor substation building for selection and construction.
- provision must be made within the substation building to contain any oil spillage (in the event of a transformer tank failure). Spillage from transformers shall be designed to be contained within the substation building for 110% of oil volume as per the current Australian Standard 1940 – The Storage and Handling of Flammable and Combustible Liquids.

7.4.2.2 Upper-level indoor substation

- this is a preferred option for any commercial/residential development proposal that is expected to meet DCA's 'active frontage' requirement to the public realm in the CBD areas of Darwin, Palmerston and Alice Springs in the Northern Territory.
- special dry type (containing no oil or other liquid) transformer(s) shall be installed in an upper-level indoor substation. Order for dry type transformer(s) could take up to 10 months for delivery compared to typically 3 months in the case of oil type transformer.
- indoor substation building shall be minimum height of 4 metres.
- the standard size of an ordered dry type transformer is 1000kVA and it is significantly more expensive than a standard oil type transformer.
- appropriate transformer lifting beam and lifting hoist details where required shall be designed to Power and Water's satisfaction.
- where any lifting equipment is required for the indoor substation, it shall be approved by Power and Water.
- for more technical details of first level indoor substation design compliance, refer to [Design Standards for Upper-Level Substation Chambers](#).

Notes on second or higher-level indoor substation proposals:

- there are no higher-level indoor substation standards designs and the electrical consultant shall provide all appropriate technical details to be satisfactorily accepted by Power and Water.
- a separate high voltage switching station building shall be provided by the developer within one floor of street access level.
- the high voltage rising mains and associated earthing, signalling, protection and control cables between the switching station and the upper-level indoor substation are to be contained in an approved separate, locked, fire isolated riser shaft incorporating fire barriers between floors and with provision for access at each floor for the installation and subsequent maintenance of cables.
- special arrangements for personnel access under normal and emergency conditions and specially designed, permanent lifting facilities are necessary and the developer/body corporate is responsible for providing and maintaining such facilities and for the whole lifting operation involved in installing and removing heavy equipment.

7.4.2.3 Basement level indoor substation

There are no basement indoor substation standards designs by Power and Water. The electrical consultant must have prior proven experience in basement level indoor substation designs in similar climatic conditions in the Northern Territory and provide detailed technical solutions addressing the following design concerns to the satisfaction of Power and Water prior to considering this type of indoor substation proposal:

- a. the proposed basement indoor substation building location shall be no lower than first basement floor
- b. unhindered 24 hour safe access including vehicle parking arrangement for Power and Water staff in normal and emergency situations
- c. unobstructed 24 hour all-weather access by heavy vehicle operations in normal and emergency situations to carry out routine/specific maintenance or repair, replacement work
- d. simple and safe work approach on how to remove/reinstall a transformer/high voltage switchgear asset from inside the basement indoor substation building out to ground level ready for picking up by a suitable crane

- e. appropriate ventilation method to dissipate heat releases by substation equipment under normal operating conditions to provide adequate natural air circulation between the basement substation building and open air
- f. appropriate substation walls to be constructed to reduce humidity level and water condensation inside the basement indoor substation building
- g. natural air ventilation method to prevent vehicle fume or smoke entering the basement indoor substation building where it is in the same area for car parking spaces
- h. appropriate fire alarm strategy and communication protocol to both Power and Water and Building Management Body Corporate in the event of fire or equipment explosion inside the basement substation building
- i. appropriate risk assessment and preventative method employed in the event of flood water entering the basement indoor substation building.

7.4.3 Owner responsibility

The owner or any future owner of the premises including a legal body corporate management entity with an indoor substation establishment shall be required to accept the on-going responsibility to maintain in a satisfactory condition the following:

- the building structure which encloses or forms part of the indoor substation premises including any external doors/ventilation panels/external finishes and take any necessary action to ensure drywall and floor/roof conditions and structure stability
- any vehicle access or footway on the premises which forms part of the right of way to the indoor substation building
- any ventilation openings (and passages) from the indoor substation building to open air so that they are not obstructed or interfered with.
- any ventilation systems for the substation building including any fans, motors and ducting
- any car parking or pick-up or goods loading arrangement surrounding the indoor substation building so that they are not obstructed or interfered with
- any drainage system which may affect the indoor substation building structure
- low voltage underground cables leaving from the indoor substation building to the customer's main switchboard location. In the event of any future failure, damage or upgrade requirements, it will be the responsibility of the customer to make necessary repairs or replacement of these underground power cables after obtaining an entry authorisation from Power and Water
- materials of any description are not stored in or adjacent to the indoor substation building such that, in the opinion of Power and Water, access to the substation could be compromised, or the risk of fire enhanced
- any locking device involved in gaining vehicular and/or personnel access to the indoor substation and high voltage cable route must be arranged to permit entry by Power and Water's personnel using a Power and Water standard key. Power and water will not accept a private key for specific premises.

If the indoor substation building is found to be in a continuous unsafe and/or unsatisfactory condition without appropriate action by the owner, Power and Water may cease the power supply. In such an event, the owner shall be responsible for the cost of arranging an alternative power supply (generator) to the premises until the issue is satisfactorily resolved.

In addition, the owner shall grant right of access and register appropriate electricity/access easements at no cost to Power and Water.

Acceptance of the Negotiated Connection Agreement between the owner and Power and Water shall be required prior to providing clearance to the development and energising the electrical infrastructure.

7.5 Electrical design accreditation, compliance and risk

7.5.1 Accredited electrical consultants

It is a requirement that subdivisions and other developments be designed by accredited electrical consultants.

Power and Water requires that electrical consultants are competent to design electrical assets that will be gifted to Power and Water. Electrical consultants must be accredited by Power and Water. A list of current accredited electrical consultants along with the Power and Water, Power [Approved Materials List](#) is available on Power and Water's [Power Development webpage](#).

New electrical consultants may apply for accreditation for development electrical design with proven experience and qualifications for assessment and be subject to approval by Power and Water.

7.5.2 Electrical design compliance

The developer shall provide the final development layout of each new related lot, or development plans of specific lots and appropriate zoning of the lot to the electrical consultant in order to design the required minimum basic supply.

Electrical consultants shall design the electrical infrastructure in accordance with the relevant Network Policies including but not limited to those outlined in section 2.1.

Prior to submitting any new electrical design work to Power and Water for checking and approval, the electrical consultant must:

- check on site the accuracy of the existing electrical infrastructure network
- identify all existing services where practicable
- obtain approval in writing from the relevant road authority for works within a road reserve
- obtain approval in writing with respect to electricity easement requirements from landowners if power assets are on private land
- obtain approval permit from the Aboriginal Areas Protection Authority for working in the vicinity of sacred sites, where applicable
- obtain environmental approval from the Northern Territory Environmental Protection Authority, where applicable.

The electrical consultant shall certify all electrical designs as complying with relevant network policies in the forms set out in Appendix A1 as appropriate. The certification shall be attached to the design drawings submitted to Power and Water for approval. All design drawings approved by Power and Water are valid for 12 months from the approved date for construction. Should this period be exceeded prior to commencement of the construction work or any significant changes made, the developer shall re-engage the electrical consultant to revise the design and re-submit drawings for approval in accordance with current standards.

Any changes in total number of lots, lot zoning, or the anticipated load of the proposed development after the design drawings are approved for construction are not permitted. Power and Water shall object to the

DCA on the proposed variation application unless the developer provides a written statement confirming that the electrical consultant shall re-submit the design drawings with the changes for re-approval.

On approval of the design drawings, Power and Water will provide the developer a 'Letter of Information' outlining the requirements for proceeding with the development works, and the name and contact number of the assigned Power and Water Works Management Planner for managing the construction stage.

7.5.3 Risk management in design

A Common Multiple Earth Neutral (CMEN) system shall be installed in all new developments. For underground developments a 70mm² bare copper conductor shall be installed with each feeder and be bonded at each substation or end, and at each low voltage customer connection pillar. For overhead developments the low voltage neutral shall be bonded to each steel pole.

Power and Water applies a risk-based approach in design of earthing systems (RBADES). The Power and Water standard substation earthing system designs may be used as basis of the high voltage earthing design, however it is incumbent on the electrical consultant to ensure the system is compliant with the current version of AS 2067 (Substations and HV Installations). This includes the requirement for the earthing system design risk of fatality to be less than 1×10^{-6} . The process to determine the risk is described in the current version of ENA EGO Power System Earthing Guide available for purchase at the [SAI Global store](#).

The risk may be calculated using the ENA ARGON program, all inputs and assumptions must be documented. In the event the risk target cannot be achieved, the risk shall be as low as reasonably practical and appropriate mitigations shall be considered and submitted for approval. Earth system design reports shall be submitted for approval.

8. Stage 5 - Offer (negotiated connection agreement)

8.1 Fees and charges

For detail on how the different connection services and associated fees and charges are calculated see Power and Water's [Connection Policy](#).

Power and Water will use its best endeavours to provide a negotiated connection offer within 65 business days of a connection application being accepted.

Power and Water will advise the connection applicant within 20 business days of receiving the application if there is any additional design related information that must be supplied prior to making an assessment decision on the application. The time taken by the applicant to provide the additional information is excluded from the 65-business day period.

Power and Water's negotiated connection offer will, where applicable, include the following details for the total connection charge:

- a. ancillary costs associated with providing the offer
- b. cost of network extension assets:
 - i. contestable component (i.e. built-in isolation from Power and Water's existing distribution network or as determined by Power and Water)
 - ii. non-contestable component (i.e. work required to connect the contestable component to Power and Water's existing distribution network)
- c. applicable rebate
- d. details of the applicant's cost allocation towards upstream pioneer scheme(s)
- e. details of the applicant's cost allocation towards upstream shared network works where applicable
- f. any other incidental costs and the basis of their calculation including, if relevant, costs of minor deviations from the standard specification for a basic connection service
- g. a security fee.

To raise an invoice for the final connection charge, the payee shall provide Power and Water with:

- company name
- company's Australian Business Number (ABN)
- contact person name, phone and email address
- postal address.

8.2 Network pricing proposal

Power and Water's Connection Policy and associated service costs are informed by its Network Pricing Proposal approved by the Australian Energy Regulator. The current pricing proposal can be found here:

[Pricing proposals | Australian Energy Regulator \(AER\)](#)

9. Stage 6 - Construction

9.1 Compliance and safety

9.1.1 Accredited electrical contractors

Power and Water requires that electrical contractors are competent to construct electrical assets that will be handed over to Power and Water. Electrical contractors must be accredited by Power and Water. A list of current accredited electrical contractors is available on Power and Water's [Power Development webpage](#).

New electrical contractors may apply for accreditation with Power and Water for construction works with proven experience and licensed staff.

The developer or their project manager shall advise Power and Water, in writing, of the successful electrical contractor to carry out construction of the approved design.

9.1.2 Construction compliance

All works carried out by the electrical contractor shall be audited by Power and Water in accordance with the approved design drawings. Any significant changes in the design drawings during construction stage shall be referred to the developer/their project manager and the electrical consultant for direction and be approved by Power and Water. Such changes may be considered a variation and incur additional costs from Power and Water.

The electrical contractor shall conduct all activities in compliance with the requirements of Power and Water's [Access to Apparatus Rules Manual](#) and NT Work Safe's statutory safety requirements. Safety breaches may result in the immediate withdrawal of authorisation for the individual involved, or, where Power and Water believes that the breach or breaches result from a systemic failure in the contractor's safety system, accreditation of the electrical contractor may be withdrawn.

All materials and equipment used within the works shall be sourced from a Power and Water approved manufacturer and supplier. Information regarding Power and Water approved materials and equipment can be obtained by referring to the Power and Water [Power Approved Materials List](#) via the Power and Water website.

Where the development site is subject to sacred site or environmental requirements, the electrical contractor shall comply with specific conditions indicated by the Aboriginal Areas Protection Authority or NT Environmental Protection Authority.

Prior to commencement of work, the electrical contractor must submit to Power and Water a detailed installation program identifying commencement of each phase of works and hold-points for auditing, inspection and tests. This is critical for coordination of Power and Water resources and if incomplete may lead to delays in the final connection.

Failure to submit the appropriate installation program and documentation, where critical inspections are missed, may result in refusal to accept the installed power assets; unless specific actions directed by Power and Water are satisfactorily carried out by the electrical contractor to verify the required installation. If such work is found to be non-compliant, Power and Water will require the electrical contractor to remove, remediate or reconstruct the required work at the electrical contractor's cost and advise the developer/their project manager in writing.

Power and Water shall carry out random audits during construction and a final inspection when the installation is ready for handover. Where non-conformances are identified, the developer/their project manager shall be required to rectify the issues as soon as possible.

9.1.3 Safety

Safety is Power and Water's priority. All workers accessing Power and Water assets must comply with Power and Water's safety rules and inductions.

In building, development or working with any kind of Power and Water infrastructure, you must comply with all required standards and guidelines, following the access and induction procedures that apply to you.

Visit Power and Water's [work safety and access web page](#) for more information.

9.2 Handover and clearance

9.2.1 Final inspection

At completion of the development installation, Power and Water shall conduct a final inspection with the electrical contractor. Any defect found shall be rectified as soon as practicable to avoid delays in final connection work by Power and Water.

When defects are satisfactorily rectified and confirmed in writing by Power and Water, the developer shall obtain from the electrical contractor:

- any relevant test results as per the electrical installation program or installation test plan (ITP)
- any relevant certificates of compliance (CoC) - Power and Water is required to send copies of all CoCs to the Electrical Safety Regulator for inclusion in an audit program.

9.2.2 Clearance/compliance

The handover stage is the point where Power and Water has agreed to take control and ownership of new gifted power assets. The following arrangements shall be clearly understood by all parties as to the change of ownership and responsibilities.

9.2.2.1 The developer/project manager

Prior to receiving an electrical clearance, the developer/project manager shall submit to Power and Water all the following handover documentation:

- a. the contractor's certificate of completion and handover form (**Error! Reference source not found.**) certifying that the electrical works have been completed in accordance with the design specification and Power and Water's standards, and all employees, plant, materials and equipment are clear of the work site
- b. a signed certificate of handover of works by developer (Appendix B1: Handover of works by developer). Only the developer or director of the company has the authorisation to sign-off the form. The defects liability period will be 2 years starting from the date Power and Water accepts the Contractor's certificate of completion and handover
- c. a copy of survey plans showing correct new lot numbers, road names and appropriate electricity easements where applicable
- d. 'as constructed' drawings in A1, A3 hard copies and .dgn format electronic copy. 'As Constructed' drawings must have correct new lot numbers and road names. 'as constructed drawings determined by

Power and Water to be of an inadequate standard shall be rejected. Any information in 'as constructed' drawings that is not clear and legible at A3 sized hard copies will be rejected

- e. a copy of the Development Consent Authority's Development Permit and associated variation permits or Department of Lands, Planning and Environment (DLPE) official subdivision documents (Conditional Certificate of Acceptance and Handover of Works, Certificate of Acceptance and Handover of Works, Authority to Release Titles).

9.2.2.2 Power and Water

After receiving all relevant documents from the developer/project manager at the handover stage, Power and Water shall:

- a. check all documents for completeness
- b. check the accuracy and quality of 'as constructed' drawings against original design drawings and undertake on-site verification of these and the survey plan
- c. check proposed electricity easements are for correct locations and in compliance with standard requirements
- d. advise the developer of any non-conforming works requiring rectification. Upon completion, Power and Water will re-inspect the rectification works
- e. once satisfied, advise the developer of acceptance of the handover document, issue an Electrical Clearance Letter and signed Certificate of handover of work by developer with a valid defects liability period
- f. provide an anticipated date when power services are expected to be available to the development
- g. arrange for final connection works to place newly installed power assets safely into service
- h. take over the ownership of the gifted assets for operations.

9.3 Defects liability period

A defects liability period of 2 years shall commence from the date of Power and Water's formal advice of acceptance in the form of the signed **Certificate of Handover of Works by Developer** (Appendix B1). During this period, Power and Water will carry out operational maintenance in accordance with its normal practice and the developer shall be held responsible for all maintenance costs resulting from defective workmanship and materials. Defective items becoming apparent during the defects liability period will be referred to the developer for remedial action.

If the remedial action is not completed within the time required by Power and Water, or if it is of an emergency nature, repairs will be made by Power and Water at the developer's expense. The **Letter of Release of Defects Liability** will not be issued until payment for such repair has been received. Where required, appropriate legal action against the developer may also be considered.

9.3.1 Release of defects liability

Shortly before the end of the defects liability period, the developer or their project manager shall arrange for a joint inspection to be made, together with Power and Water, to determine if there are any defective items requiring rectification by the developer.

Following the joint inspection and after rectification of defective items, if any, Power and Water will issue a letter acknowledging that the developer is released from any further defects liability for that development.

10. Further information

If more information is required, please contact:

Power and Water Corporation

GPO Box 1921

Darwin NT 0801

Email: powerdevelopment@powerwater.com.au

Phone 1800 245 092

11. Definitions

Term	Meaning
Augmentation	Is work to enlarge the system or increase the capacity to transmit or distribute effectively.
Axe handle lot	Is a lot connected to a public road by a single narrow access way.
Basic supply	Is where the maximum demand of the electrical installation is less than or equal to 100 amps per phase for urban, rural and rural living customers. In a high density urban residential, basic supply is based on the lot zoning (SD, MD or MR) and the area of the lot. In a typical industrial subdivision, the basic supply shall be the agreed kVA for the specific development determined in accordance with AS3000.
Basic connection service	<p>As defined in Power and Water’s Connection Policy, in general, basic connection services include:</p> <ul style="list-style-type: none"> • connection of residential and small non-residential premises where: <ul style="list-style-type: none"> – supply is available (i.e. there is a power asset (overhead or underground) available at the required voltage and with sufficient capacity for the proposed connection) – no network augmentation required – the maximum demand of the electrical installation is less than or equal to 100 amps per phase. • connection of micro embedded generation (e.g. solar PV installations) or storage with total system capacity as per the requirements of AS4777 (grid connection of energy systems via inverters installation requirements) that are: <ol style="list-style-type: none"> (1) smaller than 30 kVA 3-phase or 10 kVA single-phase (2) consistent with Power and Water’s process regarding small inverter connected generators, where there is no network augmentation required. <p>Based on the above definition and scope, basic connection services do not apply to:</p> <ul style="list-style-type: none"> • real estate developers • residential and non-residential customers with maximum demand of the electrical installation greater than 100 amps per phase • embedded generating unit operators that are not micro embedded generators.
Battle axe lots	Are groups of at least 2 lots connected to public roads by narrow access ways, with the access ways located adjacent to each other.
Connection	Is a physical link between a distribution network and a retail customer’s premises to allow the flow of energy.

Term	Meaning
Connection alteration	Is an alteration to an existing electricity connection, including an addition, upgrade, extension, expansion, augmentation or any other kind of alteration.
Connection charge	Is a charge imposed by Power and Water for provision of a connection service, as per the Connection Policy and outlined in the relevant Negotiated Connection Agreement.
Connection service	Is either a service relating to a new connection or a connection alteration, or both, provided by Power and Water. See Basic connection service and Negotiated connection service.
Connection work	Is the work Power and Water must undertake to provide the connection service, which may include extending or augmenting the electricity transmission or distribution system, constructing connection assets and changing or reconfiguring the meter at the premises.
Design certification	The electrical consultant shall certify all designs as complying with this Policy in the forms set out in Appendices A and B. The certifications shall be attached to the design drawings submitted to Power and Water for approval.
Electrical consultant	Refers to the certified designer who carries out the subdivision or development electrical design on behalf of the developer.
Extension	An augmentation that requires the connection of a power line or facility outside the present boundaries of the transmission or distribution network owned, controlled or operated by Power and Water.
Low voltage (LV)	As defined in Power and Water's Service and Installation Rules (NP018).
Negotiated Connection Agreement (NCA)	An agreement between a Customer and Power and Water for the delivery of a connection service.
Negotiated connection service	As defined in Power and Water's Connection Policy , negotiated connection services are those connection services that do not meet the definition of a basic connection service or where the connection applicant elects to negotiate the terms upon which the connection is provided. Examples of negotiated connection services may include: <ul style="list-style-type: none"> • extension of the existing high voltage and low voltage networks, including suitable substations • establishment of a dedicated zone substation and/or high voltage feeder(s) • connections to a real estate development.

Term	Meaning
Point of entry (POE)	<p>As defined in Power and Water’s Service and Installation Rules (NP018) namely:</p> <ul style="list-style-type: none"> the point where the underground service cable connects to the consumers’ meter box.
Point of supply	<p>As defined in Power and Water’s Service and Installation Rules (NP018) namely:</p> <ul style="list-style-type: none"> the point where Power and Water makes supply available for customers. This point delineates the responsibility between Power and Water and the customer. <p>For low voltage supply, this is one of the following:</p> <ul style="list-style-type: none"> a nominated point on a distribution substation located on the customer’s block. a (usually fused) point on a Power and Water pillar located on the customer’s block. the underground point of supply is at the pillar or substation for: <ul style="list-style-type: none"> commercial and industrial customers unit blocks with a body corporate the underground point of supply is at the pillar or property boundary for residential customers. <p>For high voltage supply, the point of supply will be as agreed between the customer and Power and Water and will generally be at the terminals of a high voltage metering unit located on the customer’s block.</p>
Real estate development	<p>The commercial development of land including its development in one or more of the following ways:</p> <ol style="list-style-type: none"> subdivision of a block of land into more than one premises the construction of commercial or industrial premises (or both) the construction of multiple new residential premises.
Reticulation	<p>Is any component of an electricity distribution system including the provision of adequate transformer capacity. An electricity distribution system comprises overhead or underground reticulation (underground cables, aerial conductors, switches, and transformers) up to 22,000 volts, owned by Power and Water, and generally located on a gazetted public road.</p>
Regulated network	<p>Refers to one of the following Northern Territory electricity systems:</p> <ul style="list-style-type: none"> Darwin-Katherine electricity system Tenant Creek electricity system Alice Springs electricity system. <p>Regulated networks are regulated by the Australian Energy Regulator (AER). Electricity systems outside of the above, such as in minor centres and remote communities, are unregulated networks.</p>

Term	Meaning
Road owner	Is the appropriate authority (Department of Logistics and Infrastructure, or local Council) that has legal rights to control all activities on that road
Rural area	Refers to an area that is not an urban area (see below) and generally refers to lots predominantly larger than 0.4 hectares that may generally only be developed for rural residential or farming/rural purposes.
Security	Is an unconditional and irrevocable bank guarantee.
Service	Refers to the low voltage overhead or underground line running from a pole or pillar owned by Power and Water, which crosses the property boundary of the lot, and runs to the Point of Supply located on the lot.
Serviced	A low voltage supply is available at some point within servicing distance of the property boundary of a lot.
Servicing distance	<p>Is as defined in Power and Water’s Service and Installation Rules (NP018), namely:</p> <p>For an overhead service, a distance, not exceeding 40 metres, that permits a service to be run without exceeding the design tension, and while maintaining the required ground clearance as defined in the Standards Manual. Refer also to Section 5.25 of the Overhead Line Manual – Vol 1 S01-04-01-01</p> <p>For an underground service in a URD area, a distance not exceeding 60 metres from the nearest URD pillar to the point of entry (POE).</p> <p>For an underground service in an overhead area, a distance not exceeding 60 metres from the nearest pole carrying low voltage mains to the meter position.</p>
Unserviced	There is no low voltage supply available within servicing distance of the property boundary of the lot.
Urban area	Generally refers to lots predominantly of up to 0.4 hectares or in major town centres (Darwin, Palmerston, Katherine, Tennant Creek, and Alice Springs) with power services and street lighting and may be developed for residential, industrial or commercial purposes.

Table 5: Definitions

12. Appendices and supporting documents

The forms provided in the following appendices are for example only. Current forms for use can be found at the Power Development – Design and construction guidelines web page [here](#), or by clicking on the individual forms titles below.

Appendix A Certification and compliance documents

- Appendix A1: [Certificate of Electrical Design Compliance](#)
- Appendix A2: [Contractor’s Certificate of Completion and Handover](#)

Appendix B Asset transfer and handover documentation

- Appendix B1: [Handover of Works by Developer](#)

APPENDIX A1

Certificate of electrical design compliance

About this form

Use this form for an electrical design consultant to certify that the electrical design shown on the attached drawings and documents complies with Power and Water requirements and relevant Australian Standards.

How to complete this form

Complete all fields that apply to your project or application.

Where a selection table is provided, type X in the select column for each item that applies.

Attach extra pages or supporting documents if you need more space.

Do not remove field labels, section headings or table headers, as these help make the form accessible.

Project details

Field	Response
Project title	
Drawing title	
Drawing number	
Drawing revision or version	

Electrical design consultant details

Field	Response
Electrical design consultant company or organisation name	
Electrical design consultant ABN	
Electrical design consultant contact person full name	
Electrical design consultant phone	
Electrical design consultant email	

Developer details

Field	Response
Developer company or organisation name	
Developer contact person full name	
Developer contact phone	
Developer contact email	

Certification statement

I/we certify that the electrical design shown on the attached drawings and documents complies with:

Power and Water Corporation Power Services Drawing Standards

Power and Water Design Requirements as specified in NP041

Power and Water NP018 Service and Installation Rules

Power and Water NP010 Meter Manual

Australian Standard AS/NZS 3000 Wiring Rules

Australian Standard AS/NZS 2067 Substations and high voltage installations exceeding 1 kV A.C. and other associated Australian Standards publications.

Design compliance checklist

Type X in the select column for each item checked and confirmed as compliant.

Select	Checklist category	Requirement checked
	Overhead design details	High voltage conductor selection and sizing
	Overhead design details	Low voltage conductor selection and sizing
	Overhead design details	Substation size and location
	Overhead design details	Ground clearance compliance
	Overhead design details	Road crossing ground clearance compliance
	Overhead design details	Low voltage drop calculation compliance
	Overhead design details	Maximum design tension calculations
	Overhead design details	Risk Based Approach in Design of Earthing System (RBADES) assessment compliance

Select	Checklist category	Requirement checked
	Underground design details	High voltage cable selection and sizing
	Underground design details	Low voltage cable selection and sizing
	Underground design details	Substation type, size and location
	Underground design details	High voltage switchgear type and location
	Underground design details	Low voltage drop calculation compliance
	Underground design details	Pillar type and location
	Underground design details	RBADES assessment compliance
	Underground design details	Low voltage service arrangements
	Underground design details	Low voltage circuit breaker type, size and location
	General requirements	Maximum demand in kVA and location
	General requirements	Low voltage circuit breaker protection settings
	General requirements	N-1 reliability criteria compliance
	General requirements	Environmental and heritage considerations
	General requirements	Sacred site clearances obtained (Australian Protection Authority - APA permits)
	General requirements	Road owner approvals obtained
	General requirements	Electricity easement requirements identified

Designer certification

Field	Response
Name of electrical design consultant	
Accreditation number	
Consultant signature	
Certification date	

Power and Water use only

Field	Response
Design officer full name	
Date received	
Date approved	
Comments	
Approved by full name	
Approver position title	
Approval date	

APPENDIX A2

Contractor's certificate of completion and handover

About this form

Use this form when new gifted power assets are to be handed over to Power and Water and construction contractor is certifying that the electrical works have been completed in accordance with the design specification and Power and Water's standards, and all employees, plant, materials and equipment are clear of the work site.

How to complete this form

Complete all fields that apply to your project or application.

Where a selection table is provided, type X in the select column for each item that applies.

Attach extra pages or supporting documents if you need more space.

Do not remove field labels, section headings or table headers, as these help make the form accessible.

Project details

Field	Response
Project title	
Project address	
City or town	
Post code	
Description of completed assets being handed over	
Reference drawing DGN numbers	

Contractor details

Field	Response
Contractor company or organisation name	
Contract number	
Contractor ABN or ACN	
Electrical licence number	

Field	Response
Contractor contact phone	
Contractor contact email	

Confirmation statements

Type X in the select column to confirm each statement.

Select	Confirmation statement
	I certify that the above works have been completed in accordance with the project specification and Power and Water standards, that they are ready for commissioning and are hereby handed over to Power and Water.
	I further certify that all employees and agents of myself and/or my company and all plant, materials and equipment are clear of the works and that all employees and agents have been instructed by myself to keep clear of the works.

Contractor certification

Field	Response
Date of completion	
Signed by	
Signatory full name	
Signature date	

Appendix B1

Handover of works by developer

About this form

Use this form when a developer or project manager is handing over completed gifted power assets, or completed power works, to Power and Water for operation and maintenance.

How to complete this form

- Complete all fields that apply to your project or application.
- Where a selection table is provided, type X in the select column for each item that applies.
- Attach extra pages or supporting documents if you need more space.
- Do not remove field labels, section headings or table headers, as these help make the form accessible.

Project and location details

Field	Response
City, town or hundred	
Street or road name	
Project title or project number	
Details of completed assets being handed over	

Developer or constructor details

Field	Response
Developer or constructor company or organisation name	
Developer or constructor ABN or ACN	
Developer or constructor contact person full name	
Developer or constructor email	
Developer or constructor phone	

Handover statement

Subject to the developer or project manager carrying out remedial works by the date specified in the attached list of defects, the gifted power assets, or the above works as the case may be, have been practically completed and are now ready to be taken over by Power and Water for operation and maintenance.

Handover documents and key dates

Field	Response
As-constructed drawing number(s)	
As-constructed drawing handover date	
Survey or easement drawing number(s)	
Survey or easement drawing handover date	
Attached list of defects reference	

Developer declaration

Field	Response
Developer authorised representative signature	
Developer authorised representative full name	
Developer declaration date	

Power and Water acceptance

All required gifted asset handover documents received and accepted.

Field	Response
Power and Water Demand and Development Services officer signature	
Power and Water Demand and Development Services officer full name	
Acceptance date	
Defects liability period commencement date	
Defects liability period expiry date	

As constructed power assets and survey plan electricity easements verified and accepted for defects liability period.

Works Management Planner verification

Field	Response
Power and Water Works Management Planner signature	
Power and Water Works Management Planner full name	
Verification date	

Approval

Field	Response
Manager Distribution Development approval	
Manager Distribution Development full name	
Approval date	

Contact

Power and Water Corporation

GPO Box 1921

Darwin NT 0801

Email: powerdevelopment@powerwater.com.au

Phone 1800 245 092

powerwater.com.au