Network Standard

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Title:
Site Selection and Preparation for Kiosk Substations

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Revision

No	Date	Description	Technical Approver	Authorised By
3	10/02/2023	Conversion to new template and update of requirements, including kiosks near corner lots, R type kiosks and permanent on-title restrictions.	Joseph Metti	Mark Ragusa
4	22/05/2023	Minor amendment to cover on-title restrictions for brownfield developments in Clause 7.2	Joseph Metti	Mark Ragusa
5	18/06/2024	Minor amendment for retaining walls and new Figure C1 added to Annexure C.	Joseph Metti	Jacob Bayley
6	2/11/2026	Minor amendment to add drawing 255306 to Cl 6.3.1 based on advice from Earthing.	Joseph Metti	Alex Watters

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Table of Contents

Scope **3**
Reference Documents **3**
Ausgrid Documents **3**
Other Standards and Documents **3**
Acts and Regulations **4**
1 Kiosk Arrangements **5**
2 Site Requirements **5**
3 Site selection **6**
4 Site plans and site preparation **7**
5 Services and encroachments **8**
6 Requirements for off-street locations **9**
7 Substation tenure for off-street locations **9**
8 Access requirements **10**
9 Environmental requirements **10**
10 Other authority requirements **11**
11 Fire segregation requirements **11**
12 Blast resisting barriers **12**

List of Annexures

Annexure A: Site Requirements for Off-Street sites 14
Annexure B: Weight of Kiosk Assemblies 16
Annexure C: Retaining Walls and Batters 17
Annexure D: Pier Foundation Details 19

Scope

This Network Standard sets out the requirements for site selection and site preparation for kiosk distribution substations. It applies to both footpath and off-street locations.

The site selection and site preparation requirements specified in this Network Standard are intended to satisfy site suitability requirements, this Network Standard:

- applies only to kiosks with Ausgrid type descriptors L, K and R;
- applies only to nominal 11kV primary voltage systems;
- applies to kiosk housings used for control points and for control of supply to high voltage customer installations (HVCs);
- does not apply to SWER systems;
- does not apply to kiosk substations that are located on zone or sub-transmission substation sites and are used only for supplies within the zone or sub-transmission substation sites; and
- does not apply to kiosk housings used for other purposes.

This Standard does not cover the design of electrical systems, the installation of high and low voltage mains, or the installation of substation equipment.

Refer to NS117 for details of the equipment installed in these kiosks, including transformers, high voltage switchgear, distributors and electrical protection equipment.

Refer to NS116 for information on clearance requirements from telecommunications pits and pillars.

Refer to NS109 for requirements and limitations on usage of the various kiosk types.

Refer to NS104 in relation to the responsibility for obtaining consent from other parties.

Reference Documents

All work covered in this document shall conform to all relevant Legislation, Standards, Codes of Practice and Network Standards.

Ausgrid Documents

NS001 Glossary of Terms

NS104 Specification for Electrical Network Project Design Plans

NS109 Design Standards for Overhead Supply Developments and Distribution Centres

NS116 Design Standards for Distribution Equipment Earthing

NS117 Design and Construction Standards for Kiosk Type Substations

NS143 Easements, Leases and Rights of Way

NS174 Environmental Procedures

NS195 High Voltage Customer Connections (HVCs)

151572 - Type L Kiosk (Type T2) Layout Option Plan

151190 - Type K Kiosk (Schneider Type T3) Layout Option Plan

258017 – Type R Kiosk (Schneider HVC) Layout Option Plan

249447 – ColorBond Fence, Isolating Post detail

255306 – Ausgrid Boundary Fences, Standard Drawing, Isolating Post Details

Other Standards and Documents

AS/NZS 1596 - The Storage and Handling of LP Gas

AS 1940 – The Storage and Handling of Flammable and Combustible Liquids

AS/NZS 2229.2 – Fuel Dispensing Equipment for Explosive Atmospheres.

AS 2419.1 – Fire Hydrant Installations – Part 1 System Design, Installation and Commissioning

AS/NZS 2430 – Classification of Hazardous Areas

AS 4678 - Earth-retaining structures

SAA HB 100 (CJC 4) Co-ordination of Power and Telecommunications: Manual for the establishment of safe work practice and the minimisation of operational interference between power systems and paired cable telecommunications systems

Acts and Regulations

Electricity Supply (General) Regulation 2014 (NSW)

Electricity Supply (Safety and Network Management) Regulation 2014 (NSW)

Environmental Planning and Assessment Act 1979

Noise Policy for Industry (2017)

Protection of the Environment Operations (Noise Control) Regulation 2017

Protection of the Environment Operations Act 1997

Work Health and Safety Act 2011 (NSW)

Work Health and Safety Regulation 2017 (NSW)

Clause	Standard Requirements

1 Kiosk Arrangements

1.1 Limitations on usage, siting and installation of kiosks

1.1.1 The following kiosk usage, siting and installation limitations apply:

- L type kiosks shall be installed as specified in Drawing 151572.
- K type kiosks shall be installed as specified in Drawing 151190.
- K type kiosks are not permitted on footpath sites.
- R type kiosks shall be installed as specified in Drawing 258017.
- Various other usage and siting limitations apply, as specified in Sections 2 to 12 and Annexure A.

1.2 Multiple kiosks

1.2.1 The installation of multiple kiosks within a single premises shall subject to the written approval of Ausgrid.

1.2.2 Where multiple kiosks are installed at a premises, each individual kiosk site shall comply with the site dimensions required in Annexure A and each kiosk shall be positioned within its individual site so as to achieve the specified minimum clearances to its site boundary.

1.2.3 The HV ends of L and K type kiosks shall be located facing each other (where kiosks are positioned end-to-end), or at the same end (where kiosks are positioned side-by-side).

1.2.4 Where blast resisting barriers are necessary in accordance with the requirements of Section 11, or where the customer requires blast resisting barriers between or beside kiosks, the blast resisting barriers shall not encroach into the clearance space required around each kiosk.

2 Site Requirements

2.1 General

2.1.1 Kiosk substations shall be located in areas that are well drained (no ponding) and are clear of underground or overhead obstructions as required by Clause 2.2 and Section 5.

2.1.2 To minimise soil erosion effects and long-term movement of the kiosk assembly, the kiosk site area (refer to Annexure A) shall be level, or made level using suitable retaining structures.

2.1.3 Kiosk substation sites shall comply with the environmental and fire segregation requirements specified in Sections 9 and 11.

2.1.4 All kiosk substation sites shall comply with the Standards Australia Handbook SAA HB 100 (CJC 4) Co-ordination of Power and Telecommunications.

2.2 Site limitations

2.2.1 Kiosk substations shall not be installed in the following areas, unless Ausgrid determines that there is no reasonable alternative:

- areas prone to stormwater run-off or ponding;
- areas subject to declared 1 in 100 year floods;
- areas less than one metre above the mean high water mark;
- ocean-front areas where storm wave erosion could affect the site, or where storm wave conditions could cause access difficulties;
- exposed ocean-front locations subject to salt laden winds or coastal environments which demonstrate accelerated corrosion to existing infrastructure;
- locations defined as coastal vulnerability areas;

- unstable areas; and
- roadway restriction areas including kerb blisters or similar traffic control narrowing.

2.2.2 Kiosk substations and/or associated cables shall not be installed on contaminated sites, or on landfill sites where gas emanating from the landfill may cause construction or safety problems. This requirement does not preclude the building-up of a kiosk site for levelling purposes in a non-landfill area, provided the site complies with all other Ausgrid requirements.

2.2.3 Any proposals associated with landfill sites shall be discussed at the initial stages of the project with Ausgrid's Distribution Design before any design work is commenced.

2.2.4 Kiosk substations shall not be installed within buildings, on elevated building roofs, in chambers, or in covered parking areas or garages.

2.2.5 Kiosk substations shall not be installed in building alcoves or under roofed or partly roofed areas.

2.2.6 The top of the kiosk base shall be not more than 2 metres above or below the access roadway level or street footpath level adjacent to the kiosk site. The difference in levels shall be measured from the point of personnel access adjacent to the kiosk site to the access roadway level or street footpath level. Safety railing shall be installed where a person could fall from the kiosk site or the access path or steps.

2.2.7 The siting of kiosk substations in the vicinity of public swimming pools, service stations, flammable gas or liquid storage tanks shall be avoided, unless Ausgrid determines that there is no reasonable alternative. The ASP/3 is responsible for the control of any potentially hazardous situation that may arise from substations located near these structures. Reference shall be made to AS/NZS 1596, AS 1940, AS/NZS 2229.2 and AS/NZS 2430.

2.2.8 To avoid potential electrical hazards, high voltage electrical distribution equipment such as transformers (kiosks) and distribution boards shall not be within 10m of external fire hydrants, except where protected by an intervening wall or barrier. Refer to AS 2419.1.

2.2.9 Kiosk substations shall not be sited under overhead high voltage power lines of nominal voltage 11kV or above.

2.2.10 Kiosk substations shall not be sited closer than 20 metres to a structure carrying 132 kV overhead power lines. Where 132 kV overhead power lines are constructed along a public roadway, kiosk substations shall not be located on the footpath on the same side.

2.2.11 Kiosk substations shall not be sited within a railway corridor alignment.

2.2.12 During the initial selection of kiosk sites at the subdivision stage, the likely future locations for swimming pools shall be assessed. Refer also to Clause 3.3.

3 Site selection

3.1 Off-street locations

3.1.1 The minimum site dimensions for the types of kiosk substations covered by this Network Standard are indicated in Annexure A, which also describes the restrictions on some of the siting options.

3.1.2 Refer to Section 6 for other site requirements and Section 7 for details of site tenure requirements.

3.2 Footpath sites

3.2.1 The following requirements shall be addressed for kiosk substations on footpath sites within the road reserve. These sites:

- shall not be used where the requirement for the substation is in the first instance created by an application by a single applicant or a developer (eg a factory, a commercial building, a parcel containing multiple residential or industrial units, or a community title development);
- shall not obstruct a road user's view of traffic at, or approaching, intersections;

- shall not obstruct a road user's view of traffic at crests, curves, roundabouts or other locations, where a traffic accident could reasonably be attributed to loss of view caused by the kiosk;
- shall not obstruct a road user's view of traffic when the road user is about to enter the carriageway of a road from a driveway;
- shall not be vulnerable to damage by reasonably expected traffic movements;
- shall not be located at or adjacent to roundabouts and traffic calming devices;
- shall not be located at "No Stopping" zones unless there is no suitable alternative site available and adequate traffic management is possible, including nearby parking;
- shall not be less than 500 mm from the footpath side edge of the kerb line, unless a lesser distance is essential and all other siting requirements are satisfied;
- shall permit any kiosk access door to be opened and accessed without having to encroach over the footpath side edge of the kerb line;
- shall not be located within 3 metres from the legally enforceable limits of public transport stops and pedestrian crossings;
- shall not be positioned at intersections or in other locations frequented by pedestrians, where an accident to a pedestrian by traffic could reasonably be attributed to loss of view caused by the kiosk;
- shall be assessed for their impact to the amenity of the adjacent environment and to adjacent environmentally sensitive or significant locations, including heritage sites, aboriginal sites, memorials, lookouts, etc. Refer to Clause 9.3;
- shall not be located where an established access or probable future access to a property would be affected; and
- shall be sufficiently clear of trees and shrubs to ensure that current access is satisfactory and future access will not be compromised.

3.3 Corner lots and adjacent backyards

3.3.1 The location of off-street kiosk substations on corner allotments or adjacent to residential backyards shall be subject to the registration of a permanent on-title restriction that ensures no swimming pool can be installed on a burdened lot without written approval from Ausgrid stating adherence to safety and earthing segregation clearances to their nearby infrastructure.

3.3.2 The permanent on-title restriction on the use of land shall apply:

a) Over a portion of the lot(s) based on a site-specific engineering-based clearance distance determined by Ausgrid;

b) For each corner lot impacted, and any immediately adjacent lot sharing a common rear or side backyard boundary, subject to Clause 7.2 requirements.

3.3.3 Kiosk substations located at corner allotments shall be installed in accordance with the minimum site requirements of Site Plan B shown in Annexure A.

4 Site plans and site preparation

4.1 General

4.1.1 For contestable work, the developer/customer shall be responsible for all substation site preparation to the satisfaction of Ausgrid and for all associated costs, including piers, retaining walls and excavation of rock for the kiosk base and cable entries.

4.1.2 Site plans or sketches of each individual substation site shall be submitted for approval by Ausgrid, as part of the Design Certification process and before construction proceeds.

4.1.3 Site plans shall show existing or proposed structures and stormwater infrastructure for a radius of 10 m from the kiosk, the street location name, the name of nearest cross street, the north point and the scale of the plan.

4.1.4 For L type kiosks, site contours shall be such that the top of the kiosk base is between 120 mm and 240 mm above the finished ground level. Refer to drawing 151190 for details and requirements for K type kiosks.

4.1.5 The kiosk site shall not be in a location where sub-surface drainage will collect. If this is likely, a sub-surface drainage system shall be installed to the satisfaction of Ausgrid.

4.1.6 Unless specified otherwise by Ausgrid, kiosks installed on footpath sites shall be oriented with the high voltage end facing the oncoming traffic i.e. such that the side door (HV connection / tap changer access) is on the property side of the kiosk and not on the road side.

4.2 Retaining walls and batters

4.2.1 Sites where retaining walls and/or batters are required shall be avoided, unless there are no reasonable alternatives.

4.2.2 Where retaining walls and/or batters are necessary, these items shall comply with the requirements in Annexure C.

4.3 Pier foundations

4.3.1 Pier foundations are not required for R type kiosk substations.

4.3.2 L and K type kiosk substations installed in Ausgrid's area shall be equipped with pier foundations, except where exempted by this Clause 4.3, to support the weight of the kiosk and concrete base during the installation of cables and to prevent subsidence of the kiosk over time.

4.3.3 Pier foundations are not mandatory when undertaking like-for-like kiosk replacement at existing locations with negligible ground movement.

4.3.4 Pier foundations are not mandatory for L type kiosks installed on solid rock, but piers may assist in cable installation and there are additional requirements (Annexure D) if piers are not installed.

4.3.5 All K type kiosks shall have pier foundations.

4.3.6 Refer to Annexure D for pier foundation details.

5 Services and encroachments

5.1 For off-street locations, services such as drains, sewers, pipes and wiring, shall not pass through or under the kiosk substation overall site area. Refer to minimum site requirements in Annexure A and the drawings indicated in Clause 1.1. Refer also to the drawings for the range of acceptable entry angles for consumers' mains at the kiosk.

5.2 For footpath sites, it is generally not possible to have a site the size of a standard kiosk easement which is clear of other services. For footpath sites, the following requirements shall apply which are in addition to the requirements outlined in Clause 3.2:

- There shall be no other services directly beneath the footprint of the kiosk;
- There shall be sufficient space around the kiosk to allow cables to be connected to the kiosk;
- The minimum service separations shall be confirmed with the other Utility/Service Providers in accordance with the NSW Streets Opening Conference Guide to Codes and Practices for Streets Opening; and
- Earthing shall be in accordance with NS116 i.e. the electrodes may be installed either in the footpath cable allocation in accordance with drawing 167433, or in the pole line allocation as per drawing 36377 for pole mounted substations. The pole line allocation shall be given the higher priority.

6 Requirements for off-street locations

6.1 Protection from vehicles

6.1.1 Kiosks shall be protected from damage by vehicles in areas classified as high risk for vehicle impact, such as adjacent to driveways, drive-thru areas, community / customer car parking etc.

6.2 Landscaping

6.2.1 The finished surface of the kiosk substation site shall be either blue metal, lawn grass, pine bark woodchips, pavers or asphalt. Asphalt shall only be used where specified as part of the earthing design. Refer to NS116 for asphalt requirements.

6.2.2 When selecting the landscaping surface, the customer shall be responsible for the impact the finished surface may have on the adjacent footways either by direct interference or the landscaping material spilling onto it.

6.2.3 Other surface finishes shall be at the discretion of Ausgrid's Distribution Design, provided the customer agrees in writing to bear all costs resulting from any future need to excavate and reinstate around the substation, irrespective of whether or not the excavation is associated with supply to the customer.

6.2.4 Ausgrid shall not be responsible for damage to landscaping where excavation for cable works or equipment replacement occurs in the future.

6.2.5 Screening vegetation shall not interfere with access to the substation for both personnel and equipment.

6.2.6 Trees, shrubs, or plants, other than lawn grass, shall not be permitted on the substation site.

6.2.7 Watering systems shall not be installed within the substation site or designated personnel access routes.

6.3 Fencing

6.3.1 Where it is intended to fence around off-street locations, attention shall be given to the following issues:

- Earth potential rise, under fault conditions, which may be transferred along a metallic fence. This may require wood fence posts in the vicinity of the kiosk (refer to drawings 249447 and 255306 for typical arrangements), or in some cases the whole section of fence may need to be non-metallic. Each substation shall be treated on its own merits with advice sought early in the project design from Ausgrid as required. The major factors which will affect this are:
  - the local soil resistivity;
  - whether the 11kV feeder is underground all the way back to the Zone Substation (i.e. providing a return path by cable sheath continuity); and
  - whether the kiosk connected to an adequate interconnected MEN system.
- Kiosks shall be "fenced out" of the property not "fenced in". Refer also to Section 8 regarding access requirements; and
- The distance between fence and kiosk shall be sufficient to prevent people jumping from the top of one to the other.

7 Substation tenure for off-street locations

7.1 In all off-street kiosk site locations, an easement shall be provided at the development stage to minimise ongoing land title problems. The following site criteria shall also apply:

- for URD areas, kiosk substations shall be sited on park boundaries, access lanes and public land, subject to site availability and local council negotiations (refer to Section 10);
- for high/medium density residential developments, kiosk substations shall be sited with one edge of the overall substation site boundary at the front road boundary of the development where possible; and

- for industrial or commercial developments, kiosk substations shall be sited with one edge of the overall substation site boundary at the front road boundary of the development where possible. Where the kiosk site is not located adjacent to a public roadway, an easement shall be provided for the kiosk site, and an easement and right-of-way for cable and personnel access.

7.2 For off-street kiosk site locations as indicated in Table 1, permanent on-title restrictions on the use of land shall be provided at the development stage to ensure that the requirements of this Network Standard can be enforced. The Table 1 restrictions apply as follows:

- Greenfield developments shall comply with the on-title restrictions over all affected lots;
- Brownfield developments shall comply with the on-title restrictions over those lots within the development only.

Table 1 – Permanent on-title restrictions on the use of land

Location	Permanent On-Title Restriction		References
	L and K Type	R Type	
Off-street	3m fire restriction	2m fire restriction	Clause 11.5 and Clause 11.6
Off-street	6m building ventilation system restriction	N.A.	Clause 11.5
Off-street – residential corner lots	Swimming pool restriction	Swimming pool restriction	Clause 3.3

7.3 Ausgrid requires that restrictions on the use of land be created by registration on the title of the land, to ensure appropriate segregation from the kiosk is maintained by both current and future owners.

7.4 For further details of land tenure requirements and requirements for easements, rights-of-way and restrictions on the use of land refer to NS109 and NS143.

8 Access requirements

8.1 Kiosk sites shall have unimpeded access for Ausgrid personnel and vehicles, directly from a public street, for 24 hours per day, 7 days per week.

8.2 A heavy truck with a vehicle-mounted crane is required to install or remove the kiosk and equipment. Access routes, where required, shall be suitable under all weather conditions and constructed to withstand the maximum road legal wheel loadings and loadings during kiosk installation.

8.3 The access route shall be a minimum of 4 metres wide, have a minimum of 4 metres headroom, provide increased width for turns where required and be continuous from the property boundary to the kiosk site.

8.4 For kiosk sites other than footpath, reserve or URD sites, the site owner/customer shall be responsible for providing and maintaining access routes and surface finishes, to the satisfaction of Ausgrid, as specified in the easement document.

8.5 Access from the street to the kiosk site shall not be fenced or enclosed, except where approval is given in writing by Ausgrid and the conditions listed in the approval are complied with on an ongoing basis by the site owner/customer.

9 Environmental requirements

9.1 Oil containment

9.1.1 The oil containment measures for kiosks are designed to fully contain any oil that may leak from the transformer. To further minimise any risk to the environment, the location of kiosk substations in the following situations shall be avoided wherever reasonably practicable:

- in close proximity to rivers, creeks, natural or man-made water courses, stormwater drains, or paved surfaces or concrete aprons that drain to the stormwater system;
- within 40 metres upstream of a waterway or sensitive environment, such as a wetland, national park or nature reserve;
- within 5 metres upstream of a grated drain or pit or where there would be less than 500 mm of permeable strip between the kiosk and the kerb;
- within an area of high groundwater, where the groundwater would be less than 1 metre below ground level;
- within an area prone to flooding, or a drainage path, or a stormwater ponding area; and
- within bushfire prone land areas, where there is a significant risk that a kiosk fault or fire could cause a bushfire.

9.2 Noise limitation

9.2.1 To reduce the possibility of noise impacts, the siting of the kiosk substation shall be assessed against the requirements of the NSW EPA's Noise Policy for Industry (2017).

9.2.2 Kiosk sites located within 12m of a sensitive receiver shall require a site-specific noise assessment as described in NS174B.

9.2.3 The ASP/3 shall be responsible to provide evidence that the substation location complies with the appropriate regulations.

9.3 Environmental assessment

9.3.1 The ASP/3 shall be responsible for providing an assessment of the environmental impacts of the proposed kiosk installation. The ASP/3 shall complete an environmental assessment, obtain other relevant approvals, and undertake the required consultation in accordance with NS174.

10 Other authority requirements

10.1 The kiosk site selection process shall assess the requirements of other authorities, including all utilities and local council.

10.2 ASP/3s shall be responsible for liaising and negotiating with other authorities, organisations and persons to obtain all necessary consents.

11 Fire segregation requirements

11.1 The siting of kiosk substations shall comply with the requirements of all relevant authorities (including fire control authorities) in relation to segregation from buildings, structures, etc.

11.2 For off-street kiosk locations, the required separation distances given in this Section for fire and building ventilation shall be included as permanent on-title restrictions, subject to Clause 7.2 requirements. This will ensure that the necessary setbacks for buildings and future developments are maintained.

11.3 Kiosk substations shall be separated from building air intake and exhaust openings and natural ventilation openings by separation distances that meet the requirements of all relevant authorities and Australian Standards.

11.4 In addition to any requirements to satisfy other authorities, Ausgrid has a general requirement for kiosk substations to be effectively segregated from neighbouring areas and buildings which are subject to fire risk.

11.5 For L and K type kiosks, the following specific additional Ausgrid requirements shall be satisfied:

- Pathways and/or fire escape routes shall not encroach upon the kiosk easement and may require a greater separation to ensure the route is not impacted in the event of a kiosk fire;
- Kiosk substation housings shall be separated from building ventilation system air intake and exhaust duct openings, by not less than 6 metres (measured by shortest string line between housing and duct). This applies irrespective of whether the building ducted ventilation system

is mechanical or natural, and irrespective of whether or not fire dampers are installed in the ducts. For the purposes of this Item:

- Ausgrid does not regard openable windows, that provide natural ventilation to one building compartment only, as a building ventilation system opening; and
- Ausgrid does not regard garage doors, that lead to the carpark of multi-dwelling buildings, as a building ventilation system opening, provided that the building ducted ventilation system for occupied areas is separate to, and fully isolated from, the carpark area;

- Any portion of a building within 3 metres in any direction from the housing of a kiosk substation shall have a Fire Resistance Level (FRL) of not less than 120/120/120, unless it is sheltered by a non-ignitable blast-resisting barrier. The requirements of this Item do not apply to a NCC (BCA) Class 10a structure constructed from non-combustible materials.
- Openable or fixed windows or glass blockwork or similar, irrespective of their fire rating, are not permitted within 3 metres in any direction from the housing of a kiosk substation, unless they are sheltered by a non-ignitable blast resisting barrier;
- Any meter, regulator or exposed pipe work associated with the reticulation of gas which is within 3 metres in any direction from the housing of a kiosk substation and which does not have a Fire Resistance Level of 120/120/120, shall be sheltered by a non-ignitable blast-resisting barrier; and
- Any portion of an area which may be used for storage of combustible material, which is within 3 metres in any direction from the housing of a kiosk substation, shall be sheltered by a non-ignitable blast-resisting barrier.

11.6 For R type kiosks, the following specific additional Ausgrid requirements shall be satisfied:

- Pathways and/or fire escape routes shall not encroach upon the kiosk easement and may require a greater separation to ensure the route is not impacted in the event of a kiosk failure;
- Any portion of a building within 2 metres in any direction from the housing of a kiosk substation shall be constructed from non-combustible materials, unless it is sheltered by a non-ignitable blast-resisting barrier;
- Openable or fixed windows or glass blockwork or similar, irrespective of their fire rating, are not permitted within 2 metres in any direction from the housing of a kiosk substation, unless they are sheltered by a non-ignitable blast resisting barrier;
- Any meter, regulator or exposed pipe work associated with the reticulation of gas which is within 2 metres in any direction from the housing of a kiosk substation and which does not have a Fire Resistance Level of 60/60/60, shall be sheltered by a non-ignitable blast-resisting barrier; and
- Any portion of an area which may be used for storage of combustible material, which is within 2 metres in any direction from the housing of a kiosk substation, shall be sheltered by a non-ignitable blast-resisting barrier.

12 Blast resisting barriers

12.1 Blast resisting barriers and their foundations shall be external to the overall area required for the kiosk substation site and shall comply with the following requirements:

- The barriers shall not interfere with personnel or equipment access to the substation or with substation cabling;
- The barriers shall be constructed of non-perishable material such as concrete or brick;
- The barriers shall not contain apertures or openings such as doorways or vents even if these have a Fire Resistance Level rating;
- The barriers shall provide for concrete encased conduit penetrations where required for cable entry to the substation;

- The barriers shall not interfere with the kiosk ventilation and the escape of heat from the kiosk;
- The barriers shall be constructed to comply with any relevant Australian Standards, the engineering requirements and to the satisfaction of the local council;
- An Engineer's Certificate shall be supplied by the ASP/3 if requested by Ausgrid;
- The foundation depths shall be as specified for retaining walls in Clause 4.2; and
- The barriers shall have a minimum Fire Resistance Level of 120/120/120 (L and K type kiosks) or 60/60/60 (R type kiosks) and be designed to withstand a live loading from the substation side of not less than 2 kPa uniformly distributed.

12.2 In all cases, the location of blast resisting barriers shall be approved by Ausgrid's Distribution Design as part of the design certification process, and before construction proceeds.

12.3 The site owner/customer shall be responsible for the ongoing maintenance of blast resisting barriers.

Annexure A: Site Requirements for Off-Street sites

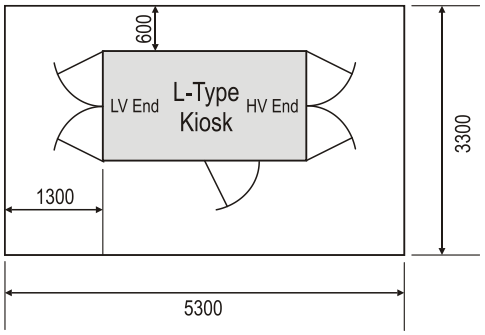
A1 General

A1.1 For each kiosk type included in this Annexure, the minimum site requirements indicated shall apply only where the kiosk site is determined by Ausgrid to be adequately ventilated and fire segregated. For kiosk sites adjacent to buildings or other substantial structures, Ausgrid may require additional clearances for adequate kiosk ventilation and fire segregation.

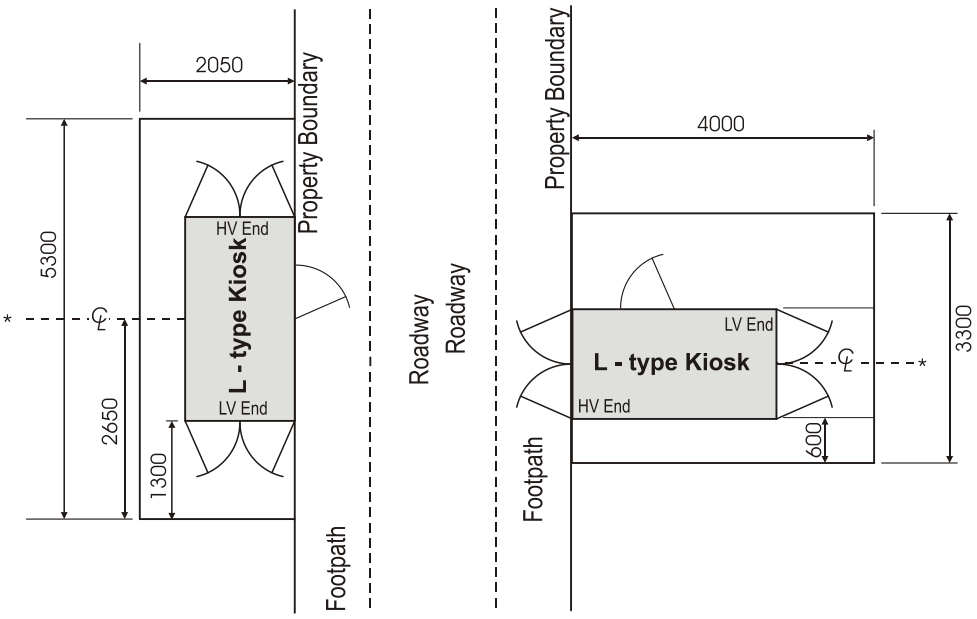
A1.2 The overall area of land shown in this Annexure includes sufficient area around the actual kiosk for personnel access, for cable routes, for installation of earthing electrodes and for hinged or removable doors to be opened or removed.

A2 L type kiosk

A2.1 L type kiosk minimum site requirements are indicated in the following site plans, and by the requirements of Clause A2.2 and A2.3:



Site Plan A



Site Plan B **Site Plan C**

A2.2 The asterisk symbol (*) shown in Site Plans B and C indicates a nominal property boundary between lots, for locations where the kiosk site is located across adjacent residential lots.

A2.3 For the L type kiosks shown Clause A2.1, the following requirements shall apply:

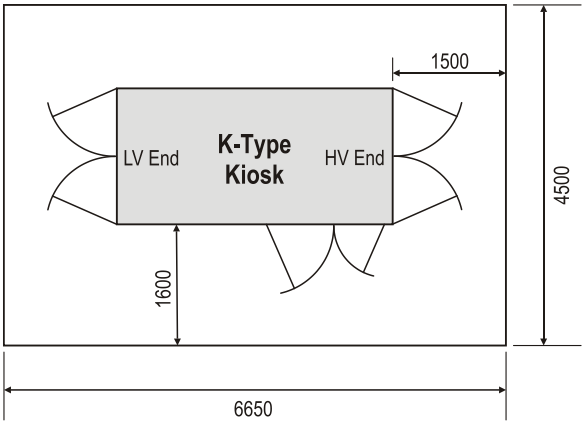
1) The L kiosk site plans shown with one edge of the kiosk structure on the street frontage property boundary (Site Plans B and C) are restricted options only available for underground

residential distribution (URD) sites. Approval for these options in areas other than URD will be at the discretion of Ausgrid, after an assessment of all relevant factors; and

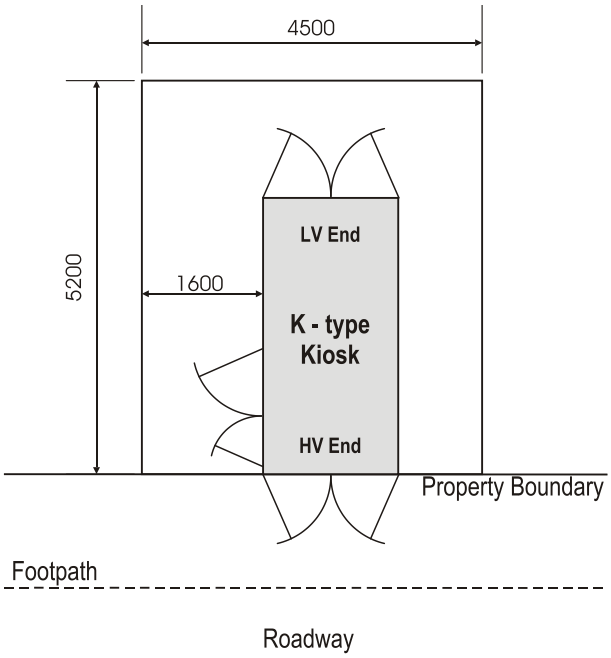
2) Where the 5300 mm x 3300 mm L kiosk site is set back from the street frontage property boundary (ie Site Plan A with additional set back), an associated cable easement and a right-of-way for access shall be established. (Refer to Section 7).

A3 K type kiosk

A3.1 K type kiosk minimum site requirements are indicated in the following site plans:



Site Plan A



Site Plan B

A4 R type kiosk

A4.1 R type kiosk minimum site requirements are indicated in the site plan shown on Drawing 258017.

Annexure B: Weight of Kiosk Assemblies

B1 Typical weights of kiosks

B1.1 Typical weights of kiosk types L, K and R complete with transformer, switchgear, bases and sundry equipment, are given in Table B1.

Table B1 – Typical weights of kiosks

L Type Kiosk		K Type Kiosk		R Type Kiosk	
Item	**Weight**	**Item**	**Weight**	**Item**	**Weight**
Kiosk with 400 kVA transformer	5275 kg	Kiosk with 1500 kVA transformer	6560 kg	Kiosk with HV switchgear only	2200 kg (includes culvert 1500 kg)
Kiosk with 600 kVA transformer	5875 kg				
Kiosk with 800 kVA transformer	6475 kg				
Kiosk with 1000 kVA transformer	7075 kg				
L Type - Maximum Weight[1]	7075 kg	K Type – Maximum Weight[1]	6560 kg	R Type – Maximum Weight[1]	2200 kg (includes culvert 1500 kg)

[1] Supporting structures and piers shall be suitable for the maximum weight applicable for the kiosk type.

Annexure C: Retaining Walls and Batters

C1 General

C1.1 Where retaining walls and/or batters are necessary, these items shall comply with the following requirements:

- Retaining walls, including foundations and batters shall be external to the minimum overall dimensions of the substation site;
- Retaining walls shall be constructed to the engineering requirements of the local council and the relevant Australian Standards (including AS 3798 and AS 4678). An Engineer's Certificate shall be supplied by the ASP/3 on request;
- Retaining walls shall be suitably drained away from the site;
- Retaining walls shall be constructed of durable and non-corrosive material such as concrete or brick;
- Backfill shall be compacted and be of suitable clean material free from large solid material over 50 mm in diameter;
- The need for handrails on a retaining wall shall be determined by a site-specific design;
- In ground other than rock, the following requirements shall apply (refer to Figure C1):
  - The level at the top of the foundations for retaining walls shall be at or below the level at the bottom of excavations for the installation of cables and / or conduits;
  - The retaining walls and foundations shall be designed to remain stable and structurally adequate at all times, including during the removal of soil at depth for the installation of cables and / or conduits;
  - The retaining walls shall provide for concrete encased conduit penetrations where required for cable entry to the substation. Details shall be included in the design by the ASP/3;
- Where the kiosk substation is located on rock, the retaining wall foundations shall provide for concrete encased conduit penetrations where required for cable entry to the substation. Details shall be included in the design by the ASP/3; and
- For kiosk sites other than footpath, reserve or underground residential distribution (URD) sites, the site owner/customer shall be responsible for ongoing maintenance, where specified in the lease/easement conditions, for the retaining walls, batter, handrails etc.

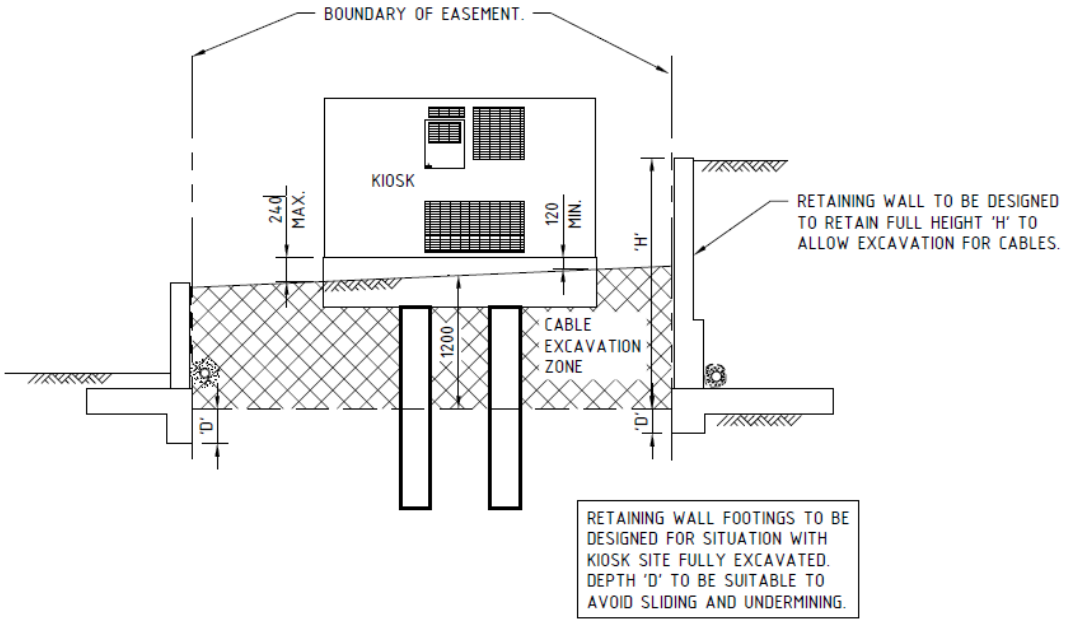


Figure C1 – Typical Retaining Wall Design (other than rock)

Annexure D: Pier Foundation Details

D1 General

D1.1 Where the kiosk site is on solid rock and piers are installed, the piers shall be socketed into the rock. Ausgrid may request a structural engineer's report in such cases.

D1.2 Where L type kiosk sites are on solid rock and piers are not installed, the requirements for deletion of the pier foundations shall be follows:

- For the entire width of the kiosk base, the area between the high voltage and low voltage cable entry holes in the kiosk base shall remain as unexcavated solid rock;
- The unexcavated rock plinth shall be level and at a finished height that will support the kiosk base at the finished level as indicated in the relevant kiosk type drawing;
- Beneath both the high voltage and low voltage cable entry holes, the rock shall be removed and replaced with compacted sand prior to the delivery of the kiosk to the site. This is to facilitate the subsequent installation of cables. The depth of rock excavation shall be appropriate for the bending radius of the cables to be installed; and
- A certificate shall be provided to Ausgrid, from a certified and practicing structural engineer, certifying that the rock plinth is adequate to support the maximum weight of the kiosk type to be installed, without movement, when the compacted sand beneath both the high voltage and low voltage cable entries is removed.

D2 Pier foundation details

D2.1 Prior to the pier foundations being installed, the developer/customer shall install site pegs to indicate the finished surrounding site level.

D2.2 The tops of the pier foundations shall be installed to support the kiosk base at a level which will achieve the specified ground clearance for the kiosk above the finished surrounding site level.

D2.3 Kiosk ground clearance, kiosk site levels, pier layout and minimum pier design specifications shall comply with the requirements of the relevant drawings indicated in Clause 1.1.

D2.4 The minimum depth for kiosk piers shall be the greater of:

- 1000 mm below the underside of the kiosk base level;
- 500 mm below the level of the ground that will be disturbed during excavation for installation of the cables; and
- 500 mm below the bottom of any other service line (eg water, sewer, gas, telecommunications, stormwater) within 2000 mm of any one of the piers.

D2.5 The maximum length of kiosk piers complying with the design specifications in the relevant drawings (refer to Clause 1.1) shall not exceed 1500 mm. The pier length equals the depth of pier from underside of kiosk base.

D2.6 Where it is necessary for kiosk piers to exceed 1500 mm in length to satisfy particular site conditions, a site-specific design by a qualified structural engineer shall be undertaken. Examples include terraced sites or sites cut into sloping ground, and sites near other large services, such as large water, stormwater or sewer mains.

D2.7 The ASP/3 shall be responsible for ensuring that pier foundations are stable and adequate and shall engage a qualified structural engineer to design the pier foundations where necessary. A structural engineer's report shall be provided to Ausgrid in such cases.

D2.8 Where pier foundations are installed for kiosks, the area around the piers shall be backfilled with sand and compacted to remove voids under the area where the kiosk base will be installed. Excavations under and around the kiosk base for cable installations shall also be backfilled with sand and compacted to remove voids.

D2.9 The kiosk piers shall be allowed at least seven days for the concrete to cure before the kiosk base is installed on the piers and before cables are installed in the kiosk base footprint area.

D2.10 After completion of the installation, the area around the kiosk shall be backfilled, compacted and restored to the finished surrounding site level.


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