Design Certification Check Sheet

28 February 2025

Project ID:			
Project Details:			
Submission Date:		**Submission Number:**	**1**
ASP/3 Designer:			
ASP/3 Email:			
ASP/3 Company:			
ASP/3 Ausgrid ID			
ASP/3 Partner ID			

NS104 Design Format & Consultation Compliance - Amendment 5			Compliant

Design Submission - Documentation

Submission 1: Ref 0	**Contract for Design Related Services**	Design Information 12 Month validity period still current.	
Submission 1: Ref 0	**3.2**	ASP/3 Company accreditation valid at time of design certification submission.	
Submission 1: Ref 0	**ASP/3 database**	ASP/3 Designer is an Ausgrid authorised designer.	
Submission 1: Ref 0	**6.0**	Designer Safety Report attached.	
Submission 1: Ref 0	**Contract for Design Related Services**	ASP/3 - Design Deed Poll (Contract for Design Related Services - Appendix 1) - signed and attached. An electronic copy is acceptable to proceed with design checking. • The nominated ASP/3 designer details align with the ASP/3 designer detailed on the design.	
Submission 1: Ref 0	**Design Information**	A completed Asset Valuation Sheet (AVS) attached.	
Submission 1: Ref 0	**4.6**	Completed street lighting form AUSPL CON F01A from Street Lighting Customer (e.g. Local Council) attached. • The project details are correct. • The sections that detail the ASP/3 designer, street lgiht designer/consultant and street light customer have been completed and signed. • If applicable - the entered PDV amount is correct.	

NS104 Design Format & Consultation Compliance - Amendment 5

Submission 1: Ref 0		Design is using the "RFT" and "RFC" compliant NetCAD template. A NetCAD Template dated before 05/09/2024 is not RFT and RFC compliant.	
Submission 1: Ref 0	**3.0**	Design is legible and capable of being clearly and completely copied or printed.	
Submission 1: Ref 0	**3.1**	Design in *.dwg or *.dgn format and submitted as a single CAD file **note:** merge all referenced files into one CAD file for submission.	
Submission 1: Ref 0	**3.2**	Correct use of Model, Layouts and Layers. • Only a single copy (either full or partial) of the GIS data is permitted within the Model space. • All proposed works is detailed on the GIS Data within the Model space. • Commercial Development Site Plan and/or Subdivision Layout Plan placed at the actual location on the GIS Data within the Model space. • Viewports reference the Model space with appropriate use of design layers to create desired layout/inset drawings.	
Submission 1: Ref 0	**3.3**	Standard Symbols used where symbols have been provided in the CAD template. Symbol Legend reflects symbols used.	
Submission 1: Ref 0	**3.5**	Drawing scaled correctly. Ensure that a scale bar is provided with each design layout and inset drawing and that scaling appears accurate.	
Submission 1: Ref 0	**3.6**	Cadastral and topographic information included. The intent is to ensure that : • relevant existing and proposed property boundaries are clearly shown on the design (as distinct from kerbs, etc) • all rivers, creeks, drop offs, etc	
Submission 1: Ref 0	**3.7**	Ausgrid standard CAD drawing templates and border formats are used.	
Submission 1: Ref 0	**3.9**	Title Block: all applicable data entry fields completed and entered information is correct.	
Submission 1: Ref 0	**3.9**	Title Block (drawing amendment): correct drawing amendment number and amended works detailed in the amendment log.	
Submission 1: Ref 0	**3.12 NS148 7.0**	Proposed, existing and removed assets labelled with correct asset number. **Note:** re-use of an existing asset number is only permitted for a pole or pillar replaced within 5m of its existing location.	
Submission 1: Ref 0	**3.12**	Correct symbol used for proposed, existing and removed assets.	
Submission 1: Ref 0	**4.1**	No general disclaimers on the design.	
Submission 1: Ref 0	**4.1**	Each work location is individually identified on the design and referenced back into the relevant construction works schedule table.	

NS104 Design Format & Consultation Compliance - Amendment 5			Compliant
Submission 1: Ref 0	**4.2**	Staged works are clearly defined and depicted. The design includes where necessary associated staged schematics and line diagrams.	
Submission 1: Ref 0	**4.3**	LV Schematic or LV Network Diagram provided and correct (Geo-Schematic format)	
Submission 1: Ref 0	**4.3**	SL Schematic provided and correct (Geo-Schematic format)	
Submission 1: Ref 0	**4.3**	HV Schematic or System Diagram provided and correct with correct connectivity with respect to construction drawing (including distances from known nodes)	
Submission 1: Ref 0	**4.3**	Substation schematic & details provided and correct including compliance with NS-158, Ausgrid Electrical Safety Rules and the Design Information regarding labelling and number sequence at distribution centres and the distribution network. **Note 1:** at a kiosk the 800amp fuseway is on the far right of the LV panel **Note 2:** at a kiosk the 1600amp fuseway is on the far left of the LV panel	
Submission 1: Ref 0	**4.4**	Project location is identifiable. Generally looking for street names, nearest cross street and relevant street/lot numbers or alternatively a locality plan.	
Submission 1: Ref 0	**4.6**	The following information is provided on the drawing or inset drawing(s) • North Point. • Legend(s). • Scale Bar. • Property lines/boundaries and lot & DP numbers. • known & proposed structures, objects, obstructions, etc.	
Submission 1: Ref 0	**4.6**	Have the following Ausgrid mandatory notation(s) from the NET CAD External Design Template been **placed on each drawing sheet:** • "CHECK FOR OTHER SERVICES BEFORE BORING OR EXCAVATION …….". • the "WARNING" notations	
Submission 1: Ref 0	**4.6**	Have the following Ausgrid mandatory notation(s) from the NET CAD External Design Template been **placed on at least sheet 1 of the drawing:** • the "GENERAL" notations. • if applicable, the "Land Base supplied by Ausgrid" notation • if applicable, the "ASP LEVEL 2 Work" notation.	
Submission 1: Ref 0	**4.6**	Have the following Ausgrid mandatory notation(s) from the NET CAD External Design Template been **placed on the design:** • if applicable, "THE APPROVED NON-STANDARD JOINT" notation.	
Submission 1: Ref 0	**4.6**	Proposed & existing assets accurately dimensioned & correctly referenced to known cadastral point. The intent is to provide a suitable dimension for new assets being installed (e.g. poles, pillars, substation, joints, road crossings etc).	
Submission 1: Ref 0	**4.6**	HV & LV sides of kiosk substations are readily identifiable on the design.	
Submission 1: Ref 0	**4.6**	Any access issues, known obstructions affecting project or features such as rock, sand, etc are avoided.	
Submission 1: Ref 0	**4.6**	All proposed and existing assets (including sub-transmission and crossings) are accurately dimensioned and referenced on the design.	
Submission 1: Ref 0	**4.8**	Detail of buildings, retaining walls, bollards, etc specified if relevant. Where applicable detailed drawings and structural engineering reports to be provided.	
Submission 1: Ref 0	**4.8**	Elevations showing ground slope(s) adjoining kiosk, building, retaining wall, level change, etc. Existing and proposed finished levels to be shown.	
Submission 1: Ref 0	**5.7**	Property Rights plan detailing existing, proposed and released property rights located on private lands provided.	
Submission 1: Ref 0	**5.7**	Property Rights shown on the CAD Model Space at the actual asset location at a scale of 1:1 for the correct use of a Layout viewport.	
Submission 1: Ref 0	**5.1**	No work proposed on existing Ausgrid assets within a private property without suitable tenure being established.	
Submission 1: Ref 0	**5.2**	Has the SER been adequately prepared and deemed verifiable by ESU or CPC.	
Submission 1: Ref 0		Does the design accurately reflect the current Design Information provided.	
Submission 1: Ref 0		Has due consideration been given to checking for overdesign.	
Submission 1: Ref 0		Distribution assets are not over-utilised.	
Submission 1: Ref 0			
Submission 1: Ref 0			

Other Non Compliance Issues

NS104 Design Format & Consultation Compliance - Amendment 5			Compliant
Submission 1: Ref 0	**NS126 6.15**	Underground HV mains loop-in of a kiosk/chamber substation on overhead mains uses existing or replaced existing poles for UGOH poles and the overhead HV mains are removed between the proposed UGOH poles.	
Submission 1: Ref 0	**NS109 4.1.8**	LV overhead network extension does not extend into private property (excluding ASP/2 works)	
Submission 1: Ref 0		LV underground network extension does not extend into private property (excluding ASP/2 works)	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS113 Site Selection & Construction - Chamber Substation - amendment 5			Compliant
Chamber Substation - Site Selection & Construction			
Chamber Substation - General			
Submission 1: Ref 0	**NS149 6.0**	Architectural Lock-in Drawings for chamber design submitted.	
Submission 1: Ref 0			
Submission 1: Ref 0	**5.1**	Chamber substation meets FRL for type of transformer equipment installed. • 180/180/180: for oil-filled equipment. • 120/120/120: for no oil-filled equipment	
Submission 1: Ref 0	**6.6**	**HVC** - No customer metering or any other customer equipment installed in the chamber**.**	
Submission 1: Ref 0	**7.2**	Geotechnical Engineers certification that the chamber size is geotechnically stable submitted.	
Submission 1: Ref 0	**7.2**	Structural Engineers certification that the chamber is designed to Australian Standards submitted.	
Submission 1: Ref 0	**7.2**	No utility services or customer equipment other than Ausgrid specified must pass through or encroach on the substation site area, access, passageways, ventilation or cable riser.	
Submission 1: Ref 0	**7.3**	Chamber not installed in the following areas without protection against flooding: • Area prone to stormwater run-off or ponding. • Area subject to declared 1 in 100yearfloods. • Area less than 1000mm above the mean high water mark.	
Submission 1: Ref 0	**7.3**	Selected substation site/access not within a hazardous area as defined in AS/NZS3000.	
Submission 1: Ref 0	**7.3**	Selected substation site/access not within a confined space area.	
Submission 1: Ref 0	**7.3**	Selected substation site/access not within an area that increases the risk of fire, explosion or other environmental issue.	
Submission 1: Ref 0	**7.3**	Selected substation site/access not within an area(s) that will be utilised for possible storage or collection area for combustible or dangerous materials or goods.	
Submission 1: Ref 0	**7.3**	Selected substation site/access does not contain any portion of another building which is not sheltered by a non-ignitable blast resistant barrier which is within 3m of a ventilation opening of the chamber substation.	
Submission 1: Ref 0	**7.4**	Ausgrid property rights cover • Cable easement(s). • Substation lease area(s). • Rights of Way - enabling 24-hour unimpeded access 7-days a week. • Ventilation ducts - refer to NS113 section 9. • Earthing installation(s) - refer to NS113 section 10. • CO2 pipe work - refer to NS113 section 14.0	
Submission 1: Ref 0	**8.1**	Dedicated access ways 1200mm wide.	
Submission 1: Ref 0	**8.1**	Doorways provide a minimum clear opening of 2400mm high and 1000mm wide when the door is in the fully open position.	
Submission 1: Ref 0	**8.1**	No access through areas deemed dangerous (e.g. guard dogs, operations involving vehicles, machinery & equipment).	
Submission 1: Ref 0	**8.1**	No access through enclosed area or courtyard other then those dedicated to the chamber.	
Submission 1: Ref 0	**8.1**	Structural component ratings of chamber and access corridor are FRL 180/180/180 for oil-filled equipment or 120/120/120 for no oil-filled equipment and 2kPa blast rating.	
Submission 1: Ref 0	**8.1**	Transformer doors are the full height of the chamber (minimum 3100mm high) and a minimum 1700mm wide.	
Submission 1: Ref 0	**8.1**	Transformer doors are 120-600mm step up from outside the chamber.	
Submission 1: Ref 0	**8.2**	Where two or more substations are located adjacent to each other, each substation chamber must be separate and each chamber must have separate access arrangements.	
Submission 1: Ref 0	**8.2**	Two (2) dedicated doorways/stairways with 24 hour access from public street.	
Submission 1: Ref 0	**8.3**	Both substation chamber access doors should be diagonally opposite or at either extreme of the Chamber Substation.	
Submission 1: Ref 0	**8.3**	Personnel access chambers must have a minimum headroom of 2500mm and a minimum width of 1200mm.	
Submission 1: Ref 0	**8.3**	Doors between personnel access chambers and TX chamber are to be 120mm step down.	

NS113 Site Selection & Construction - Chamber Substation - amendment 5			Compliant
Submission 1: Ref 0	**8.3**	Personnel Doors are to be 120 -190mm step up from outside the chamber.	
Submission 1: Ref 0	**8.3**	Stairways must be not less than 1200mm wide and headroom must be a minimum of 2200mm.	
Submission 1: Ref 0	**8.4**	A transformer handling area with sufficient space for vehicle manoeuvring must be included adjacent to the substation with a floor grade not exceeding 1:20.	
Submission 1: Ref 0	**8.4**	Minimum 4 metres (clear) headroom required along entire vehicle route to and from the transformer handling and vehicle manoeuvring areas.	
Submission 1: Ref 0	**8.4**	Positioning of any pulling rings is to provide straight pulls, clear of any pieces of equipment which do not obstruct doorways or hatches.	
Submission 1: Ref 0	**9.1**	All areas nominated for the purpose of ventilating the substation are to terminate on an external face, to free open air.	
Submission 1: Ref 0	**9.1**	Vents must not terminate in areas where heat or smoke dissipation will cause inconvenience or are subject to fire risk. Areas such as those under awnings, under car park ramps or adjacent to the entry to buildings, foyers, lobbies and car parks are to be avoided.	
Submission 1: Ref 0	**9.6**	The aspect ratio of ventilation ducts is not to exceed 4:1 and duct lengths must not exceed 10 metres.	
Submission 1: Ref 0	**9.6**	External duct inlet and outlet openings on a building are to be separated by not less than 6 meters, measured in a direct line in free air or around wall faces.	
Submission 1: Ref 0	**9.6**	The bottom edge of any duct opening is to be no less than 3 metres above any area where pedestrian traffic can be anticipated.	
Submission 1: Ref 0	**9.6**	For internal duct inlet & outlet openings, the bottom of one of the ducts is to terminate 120mm to 190mm above finished chamber floor level.	
Submission 1: Ref 0	**9.6**	Internal duct inlet & outlet openings must be positioned so that the transformers are located in cross-flow ventilation between the openings.	
Submission 1: Ref 0	**9.6**	Any portion of ventilation ducts located inside the substation or control point chamber may be constructed of sheet metal, subject to the fire damper being placed against the end of the concrete / concrete block section.	
Submission 1: Ref 0	**9.6**	Substation ventilation openings, including duct openings and louvered panels, are separated from building ventilation system air intake and exhaust openings, including those on buildings on adjacent allotments, by not less than 6 metres (Note: Openable windows that provide natural ventilation to a sole occupancy unit only, are not considered as building ventilation).	
Submission 1: Ref 0	**10.2**	If the Chamber Substation chamber or control point chamber is located on natural ground, the earthing system is to be installed directly under the chamber floor slab.	
Submission 1: Ref 0	**10.2**	If the Chamber Substation or control point chamber is constructed on a suspended floor slab, the earthing system is to be installed at the lowest level of building excavation directly below the chamber footprint.	
Submission 1: Ref 0	**11.8**	Minimum concrete encasement of 150 mm for any conduit which is located in any void between the finished substation floor slab and structural slab.	
Submission 1: Ref 0	**11.5**	Pits of depth equal to, or greater than, 1.0m must have ladders that are permanent and compliant with AS 1657.	
Submission 1: Ref 0	**11.5**	At least one conduit is required for each cable group function, e.g. protection, LV board earthing, service board power and earthing.	
Submission 1: Ref 0	**11.5**	Floor plate covers are to be a minimum 6 mm thick but must be increased to 10 mm thickness if there is any possibility of equipment, such as transformers being transported over such plates.	
Submission 1: Ref 0	**11.6**	Substation ceilings must have a FRL of not less than 180/180/180 where the substation contains oil-filled equipment, or 120/120/120 where there is no oil-filled equipment.	
Submission 1: Ref 0	**11.6**	The ceiling slab must be positioned to provide headroom of not less than 3.2 metres. The position of any beams in the ceiling should ensure the 3.2 metre headroom is maintained.	
Submission 1: Ref 0	**11.9**	A water service is to be installed on a wall in a position away from switchgear and the switchboard.	
Submission 1: Ref 0	**12.1**	The section of the external face of the substation wall, from ground level up to the base of any transformer access doors, and extending horizontally to 2m beyond the side walls of the chamber must be of solid brickwork, reinforced concrete block work or cast in-situ concrete, with a FRL of not less than 180/180/180 and must have no openings, windows, fixed glass, glass bricks or similar.	

NS113 Site Selection & Construction - Chamber Substation - amendment 5			Compliant
Submission 1: Ref 0	**12.1**	The inside of the substation transformer doors is to have facilities to contain any oil spill, in the form of a ramp down to the finished substation floor level. The top of the ramp is to be between 70 mm and 80 mm above the finished substation floor level and be preceded by a flat area of at least 300 mm with the ramp length extending 1000 mm from this flat area.	
Submission 1: Ref 0	**13.3**	Installation of EMF screening is not permitted inside any Chamber Substation, at any HVC connection, or associated chambers and cable risers.	
Submission 1: Ref 0	**13.5**	Substations must not be located below or near swimming pools, water features or storage facilities or similar locations; where possible leakage, seepage or splashing of liquid could result in wet areas on, at or inside the substation.	
Submission 1: Ref 0	**14.3**	Chambers with ventilation ducts (e.g. basement substations & surface chambers in the Sydney CBD) require a CO2 connection box visible and directly accessible from the street and both of the substation entrances.	
Submission 1: Ref 0	**14.6**	An Engineering Certification must accompany all applications for service supply involving cable risers confirming compliance with BCA fire requirements.	
Submission 1: Ref 0	**14.7**	Any portion of an area which may be utilised for storage of combustible materials which is within 3 metres of any ventilation opening from a Chamber Substation must be sheltered by a 2kPA non-ignitable blast resisting barrier (FRL 120/120/120).	
Submission 1: Ref 0			
Submission 1: Ref 0			

Surface Chamber Substation

Submission 1: Ref 0	**6.2**	Floor RL not more than 2000mm above the lowest access finished surface RL.	
Submission 1: Ref 0	**8.2**	Two (2) dedicated doorways/stairways with 24 hour access from public street.	
Submission 1: Ref 0	**9.2**	Transformer access doors are to be used for ventilation and constructed as weatherproof aluminium louvres in accordance with Ausgrid Drawing 43140.	
Submission 1: Ref 0			
Submission 1: Ref 0	**NS113**	Single Transformer Surface Chamber: substation size/layout complies with drawing 224407 or 224408.	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

Elevated Chamber Substation

Submission 1: Ref 0	**6.3**	Floor RL is between 2000mm and 6000mm from access finished surface.	
Submission 1: Ref 0	**6.3**	Has no oil filled equipment.	
Submission 1: Ref 0	**6.3**	All switching equipment is within the chamber.	
Submission 1: Ref 0	**8.3**	At least one of the personnel access ways must also incorporate a vertical shaft of at least 1600mm x 900mm.	
Submission 1: Ref 0	**8.3**	Upper and lower access chambers must incorporate a landing of not less than 1600mm x 1600mm, to facilitate moving and turning of equipment.	
Submission 1: Ref 0	**8.6**	The cable riser is to be provided with full width doors that extend the full height of the riser with an FRL of at least -/180/30.	
Submission 1: Ref 0	**9.3**	Where located on the outside face of the building the entire outside wall is to be fully louvered.	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

Upper Level Chamber Substation

Submission 1: Ref 0	**6.4**	Has a control point at street level or at a level one floor above or below street level. The control point chamber maybe a surface, elevated or basement type.	
Submission 1: Ref 0	**6.4**	Floor RL more than 6000mm above the lowest the access finished surface RL.	
Submission 1: Ref 0	**6.4**	Has no oil filled equipment.	
Submission 1: Ref 0	**7.4**	All accesses through buildings must be subject to an approved and registered Right of Way (ROW) and is unimpeded seven days a week.	
Submission 1: Ref 0	**8.2**	Personnel access is NOT from a nominated public or occupant fire stair or through parts of the building which may be occupied or tenanted.	

NS113 Site Selection & Construction - Chamber Substation - amendment 5			Compliant
Submission 1: Ref 0	**8.2**	Personnel doors achieve a FRL of 2 hours or be equal to the substation structure if the substation is rated at more than 120/120/120.	
Submission 1: Ref 0	**8.6**	The cable riser is to be provided with full width doors that extend the full height of the riser with an FRL of at least -/180/30.	
Submission 1: Ref 0	**9.3**	Where located on the outside face of the building the entire outside wall is to be fully louvered.	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

Basement Chamber Substation

Submission 1: Ref 0	**6.5**	Located in Sydney Metro area.	
Submission 1: Ref 0	**6.5**	Located on the first useable level below constructed final ground level.	
Submission 1: Ref 0	**6.5**	Floor RL not exceeding 4.3m below access point ground level RL.	
Submission 1: Ref 0	**8.2**	At least one of the personnel access ways must also incorporate a vertical shaft of at least 1600mm x 900mm.	
Submission 1: Ref 0	**8.3**	Hatchway lower access chamber is a minimum of 3500mm x 1600mm.	
Submission 1: Ref 0	**8.3**	Street level access chamber door required to have a minimum opening of 1000mm x 3000mm and be located in a position where a truck/hoist can stand and deliver equipment directly to the access shaft.	
Submission 1: Ref 0	**8.3**	Hatchway must have a minimum opening of 1410mm x 880mm.	
Submission 1: Ref 0	**8.4**	Where a transformer access chamber is used a minimum headroom of 2800mm is required along with double 3 hr fire rated doors providing a clear opening of not less than 2800mm high x 1700mm wide when in the fully opened position.	
Submission 1: Ref 0	**8.4**	Centre of the transformer hatch is within 5.2 metres of an all-weather access roadway.	
Submission 1: Ref 0	**8.3**	Hatch cover is located at road level (not near a main building entrance or in front of an emergency exit) and is within the customer's premises where vehicles cannot drive over it.	
Submission 1: Ref 0	**8.3**	Location of deep sump (300x300x300mm) is shown on design & complies.	
Submission 1: Ref 0	**8.3**	Minimum clear head clearance above hatch covers is 3.2 metres.	
Submission 1: Ref 0	**8.3**	Upper and lower access chambers must incorporate a landing of not less than 1600mm x 1600mm, to facilitate moving and turning of equipment.	
Submission 1: Ref 0	**9.4**	Dedicated inlet and outlet ventilation ducts required with minimum cross sectional areas as specified in the Network Standard.	
Submission 1: Ref 0	**14.2**	Substations with ventilation ducts (e.g. basement substations & surface chambers in the Sydney CBD) require a fire damper is required to be fitted to the opening of each ventilation duct at the substation or chamber end.	
Submission 1: Ref 0	**14.3**	Substations with ventilation ducts (e.g. basement substations & surface chambers in the Sydney CBD) require the injection of carbon dioxide (CO_2) by the fire brigade.	
Submission 1: Ref 0	**NS149 6.1**	CO_2 system drawing includes empty volume of the chamber and CO_2 bottle capacity.	
Submission 1: Ref 0	**NS149 6.1**	The Information Plan is to be sized to fit into the inside of the CO_2 connection box and is therefore to be provided within a frame of 280mm wide x 205mm high within a standard drawing sheet.	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

CBD Substation

Submission 1: Ref 0	**8.3**	SCADA equipment must not be installed in any access chamber intended for small equipment access (allowed in personnel access chambers only).	
Submission 1: Ref 0	**8.2**	Surface CBD chambers require access ways which consist of an adjoining access passageway that leads from the substation chamber to a doorway which opens to a public street or open, uncovered, unenclosed, outer area, in compliance with the BCA. A door is to be provided between the substation chamber and the access passageway.	

NS113 Site Selection & Construction - Chamber Substation - amendment 5			Compliant
Submission 1: Ref 0	**14.2**	Substations with ventilation ducts (e.g. basement substations & surface chambers in the Sydney CBD) require a fire damper is required to be fitted to the opening of each ventilation duct at the substation or chamber end.	
Submission 1: Ref 0	**14.3**	Substations with ventilation ducts (e.g. basement substations & surface chambers in the Sydney CBD) require the injection of carbon dioxide (CO2) by the fire brigade.	
Submission 1: Ref 0	**NS149 6.1**	CO2 system drawing includes empty volume of the chamber and CO2 bottle capacity.	
Submission 1: Ref 0	**NS149 6.1**	The Information Plan is to be sized to fit into the inside of the CO2 connection box and is therefore to be provided within a frame of 280mm wide x 205mm high within a standard drawing sheet.	
Submission 1: Ref 0			
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Submission 1: Ref 0			
Submission 1: Ref 0			

Other Non Compliance Issues		**Other Non Compliance Issues**	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS114 Electrical Design & Construction - Chamber Substation - amendment 10			Compliant

Chamber Substation - Design & Construction

Standard Surface Chamber Substation

Submission 1: Ref 0	**NS149 6.0**	In addition to the general NS104 requirements, the chamber design must also contain: • fully dimensional equipment layout drawings. • pit and duct layout (including conduit schedule) drawing. • lighting and power layout drawing. • earthing drawing. • information plan. • separate set of lock-in drawings in accordance with NS149.	
Submission 1: Ref 0	**NS113**	Single Transformer Surface Chamber: substation size/layout complies with drawing 224407 or 224408.	
Submission 1: Ref 0	**9.4**	Chamber substation not located adjacent to, above or below operating theatres or similar areas where sensitive instrumentation is to be installed (EMF).	
Submission 1: Ref 0	**9.4**	No magnetic shielding inside chamber enclosure.	
Submission 1: Ref 0	**9.5**	Operator locker installed in each chamber with appropriate clearances.	
Submission 1: Ref 0	**9.5**	Fire extinguishers located inside each entrance to each chamber and control point chamber.	
Submission 1: Ref 0	**10.2**	Each oil filled transformer has a space 2000mm x 2100mm.	
Submission 1: Ref 0	**10.2**	Each dry type transformer has a space 2200mm x 1525mm.	
Submission 1: Ref 0	**10.2**	Each transformer space has 1000mm clearance from walls, other equipment, pit edges or obstructions and 1000mm separation from any other transformer space.	
Submission 1: Ref 0	**10.2**	Separate LV cable chase for each transformer located immediately inside the designated transformer space and centrally under the respective cable termination point such that there is adequate provision for cable to enter chase without abrasion etc.	
Submission 1: Ref 0	**10.2**	Separate HV transformer tail conduit outlet located immediately inside the designated transformer space and centrally under the respective cable termination point.	
Submission 1: Ref 0	**10.2**	Each transformer has a separate conduits for installation of an earthing cable, signal cable, protection cables. Earthing cable conduit and protection cable conduit terminate immediately inside the designated transformer space and adjacent to the HV transformer cables (drawing 162655).	
Submission 1: Ref 0	**10.2**	All conduit openings clear of the path required for installation or removal of any transformer.	
Submission 1: Ref 0	**10.2**	Transformer(s) not placed directly under ventilation duct openings.	
Submission 1: Ref 0	**10.2**	No item, equipment or obstruction other than fire damper trip wires placed over a designated transformer space.	
Submission 1: Ref 0	**10.2**	Installation or removal of a transformer can be done without moving or de-energising any equipment, structure, cable associated with any other transformer.	
Submission 1: Ref 0	**10.2**	Clearance not less than 1100mm from all equipment is met during all stages in the movement of a transformer.	
Submission 1: Ref 0	**10.2**	Each transformer in a surface or elevated chamber is located directly in front of a transformer access door.	
Submission 1: Ref 0	**10.3**	High voltage switches shall be positioned so that the operating side is not the nearest side to the associated transformer.	
Submission 1: Ref 0	**10.3**	Sufficient clear space to manoeuvre each HV switch via the personnel access door to the associated HV pit.	
Submission 1: Ref 0	**10.3**	HV pit dimensions comply with Ausgrid drawing 191085.	
Submission 1: Ref 0	**10.3**	HV switch positioned with it operating side placed along the longer pit dimension.	
Submission 1: Ref 0	**10.3**	Pit dimension accommodates the bending radii of proposed cables.	
Submission 1: Ref 0	**10.3**	Prior approval from Ausgrid obtained for larger pit dimensions	
Submission 1: Ref 0	**10.3**	1500mm clearance between front edge of HV pit and any wall or obstruction	
Submission 1: Ref 0	**10.3**	2000mm clearance between front edge of HV pit and the front of a "E-type" switchboard	
Submission 1: Ref 0	**10.3**	Not less than 1000mm from back or side of the HV switchgear to any wall or obstruction	
Submission 1: Ref 0	**10.3**	Not less than 1000mm clearance between side connected HV switches	

NS114 Electrical Design & Construction - Chamber Substation - amendment 10			Compliant
Submission 1: Ref 0	**10.3**	Not less than 600mm clearance between each front/back connected HV switch provided there are no cable connection boxes or ancillary equipment items required to be associated from the side	
Submission 1: Ref 0	**10.4**	Front edge of LV pit is not less than 1000mm in front of a wall of the chamber.	
Submission 1: Ref 0	**10.4**	Minimum clearance of 600mm behind the LV panel and the end of the LV panel to the chamber wall.	
Submission 1: Ref 0	**10.6**	SCADA Equipment - fitted to CITY CBD substations, OAFD substations or as specified by Ausgrid	
Submission 1: Ref 0	**10.7**	If used ,single or paired free standing protection cabinets are mounted against a wall. Grouped panels are hinged external to ensure relays do not impact on adjacent relays when either or both panels are opened.	
Submission 1: Ref 0	**10.7**	1500mm clearance in front of equipment mounted on a protection panel/cabinet and not less than 1000mm at the sides of protection panel/cabinet	
Submission 1: Ref 0	**10.7**	Wall mounted protection panel or distribution board not located above or below any other equipment or obstruction. This includes equipment or obstructions offset by less than 500mm from a vertical line either side of the LV panel.	
Submission 1: Ref 0	**10.8**	The 48V protection battery charger is 1500mm above the chamber floor level	
Submission 1: Ref 0	**10.8**	The 30V battery charger is located as close as practicable to the battery, but with clearance of not less than 300mm from the side of battery	
Submission 1: Ref 0	**10.8**	Protection battery not located in close proximity to protection panels or control equipment (e.g. SCADA) where battery vapour may increase the risk of corrosion.	
Submission 1: Ref 0	**10.8**	Battery test box mounted with OAFD indication panel adjacent to the substation access door and is readily visible and accessible.	
Submission 1: Ref 0	**10.9**	The HV earth fault indicators(EFI) and associated CTs are mounted on the RHS of the HV switchgear (i.e. "outgoing" connection).	
Submission 1: Ref 0	**24.3**	Low voltage transformer tails/cables installed in cable chase and low voltage distributor cables installed in conduits. Low voltage cables not installed in common duct or in a cable chase with high voltage cables.	
Submission 1: Ref 0	**11.0**	HV switches operating side is not the nearest side to the associated transformer.	
Submission 1: Ref 0	**13.0**	Transformer cables size and number of cables is compliant.	
Submission 1: Ref 0	**14.0**	Low voltage panel configuration aligns with design information and is accurately represented in the equipment layout of the design.	
Submission 1: Ref 0	**15.1**	No more than 2 busbar supplies connected to the LV switchboard.	
Submission 1: Ref 0	**15.2**	Customers' consumer mains cable size and number of cables is compliant.	
Submission 1: Ref 0	**15.3**	The customer busbar length is the minimum possible and exits the substation through the ceiling directly above or wall directly behind or end wall directly adjacent to the "E-Type" LV board connection.	
Submission 1: Ref 0	**15.3**	The customer cable supplies exits the substation through the rear wall, side wall or floor of the LV pit. The exit point also provide a cable route which directs cables towards the associated "E-Type" LV board connection/termination.	
Submission 1: Ref 0	**16.2**	Requirements of Site Specific Earthing Report detailed on design.	
Submission 1: Ref 0	**16.2**	A combined earthing system consists of two groups of electrodes labelled "A Group" and "B Group" with correct number and positioning of electrodes.	
Submission 1: Ref 0	**16.2**	Earth electrode groups independently connected to substation earth bar.	
Submission 1: Ref 0	**16.3**	Earth electrode locations full dimensioned on the layout of equipment drawing.	
Submission 1: Ref 0	**16.4**	Substation earth bar located 300mm above substation floor level on a wall adjacent to the low voltage switchgear but not directly behind the low voltage switchgear.	
Submission 1: Ref 0	**16.4**	**Upper Level & HVC** - the control point earth bar located 300mm above the control point floor level on a wall in a location where it does not create an access hazard or near the HV switchgear or the cable entry point(s)**.**	
Submission 1: Ref 0	**16.4**	Correct earth cable(s) specified for the connection to the substation earth bar for all metalwork (e.g. cable support brackets, mechanical protection devices) not attached to a transformer.	

NS114 Electrical Design & Construction - Chamber Substation - amendment 10			Compliant
Submission 1: Ref 0	**16.4**	Correct earth cable(s) specified and proposed for the connection to a nearby substation or un-associated control point.	
Submission 1: Ref 0	**16.4**	Location of the substation earth bar (or control point earth bar, where applicable) is shown on the design.	
Submission 1: Ref 0	**16.5**	All substation equipment earths are connected to the substation earth bar.	
Submission 1: Ref 0	**17.1**	Protection requirements comply with design information.	
Submission 1: Ref 0	**17.6**	Maximum of 1200mm to top of battery from chamber floor level.	
Submission 1: Ref 0	**18.4**	Fluorescent style lighting provides a minimum of 160 Lux throughout the horizontal plane 1000mm above the floor level.	
Submission 1: Ref 0	**18.4**	light fittings are wall mounted at 2200mm above the floor level and along with associated conduits do not interfere with doors, hatchways, cables, ventilation ducts, trip wires or other equipment in the chamber substation. Note: not permitted behind "E Type" LV board.	
Submission 1: Ref 0	**18.4**	Multi transformer substations the lights are controlled by two-way switching with a switch adjacent to each personnel doorway. A single transformer substation the lights are controlled by a single way light switch at the doorway closest to the LV board. Substation with hatchway access the lights are controlled by limit switches that operate when the hatchway is opened.	
Submission 1: Ref 0			
Submission 1: Ref 0			

E Type Board

Submission 1: Ref 0	**10.4**	**"E-Type" LV Board** - clearances met (Ausgrid Drawing 178228)**.**	
Submission 1: Ref 0	**10.4**	**"E-Type" LV Board** - 600mm clearance provided from the rear and the end of the board to the chamber wall. A minimum of 1000mm is required where the side of the panel is used as a passageway or where equipment is mounted on the panel end(s).	
Submission 1: Ref 0	**10.4**	**"E-Type" LV Board** - front edge of the pit not less than 1000mm in front of a chamber wall**.**	
Submission 1: Ref 0	**10.4**	**"E-Type" LV Board** - no part of the low voltage switchboard or its components or equipment is to be closer than 1500 mm to the nearest wall edge of an access doorway or opening.	
Submission 1: Ref 0	**10.4**	**"E-Type" LV Board** - floor chases or conduits for low voltage transformer tails, Network distributors, customer cable supplies, earthing conductors, protection wiring, etc should be directed towards the centre of the associated panels on the LV switchboard.	
Submission 1: Ref 0	**10.4**	**"E-Type" LV Board** - protection wiring not within low voltage or high voltage cable chases, ducts or conduits. The high voltage cables, low voltage transformer tails and low voltage distributor cables are segregated from secondary protection and control cables**.**	
Submission 1: Ref 0	**14.3**	**"E-Type" LV Board** - LV pit steelwork to be installed to Ausgrid drawing 178229**.**	
Submission 1: Ref 0	**14.3**	**"E-Type" LV Board** - if the LV board is to be extended at a later date, the LV surge arrestor not installed on the end that is to be extended.	
Submission 1: Ref 0	**14.3**	**"E-Type" LV Board** - if the bus section panel is normally open, a LV surge arrestor panel is installed at each end of the LV board.	
Submission 1: Ref 0	**14.3**	**"E-Type" LV Board** - the LV surge arrestor panel is installed at LV board end closest to the protection and service panels**.**	
Submission 1: Ref 0			
Submission 1: Ref 0			

OAFD Protection

Submission 1: Ref 0	**17.2**	**OAFD Protection** - specified for a multi transformer substation outside Sydney CBD area**.**	
Submission 1: Ref 0	**17.2**	**OAFD Protection** - HV RMICBs and LV ACBs provided with two trip coils**.**	
Submission 1: Ref 0	**17.2**	**OAFD Protection** - indication box (Ausgrid drawing 227354) installed on chamber internal wall adjacent to the main personnel entrance to substation**.**	
Submission 1: Ref 0	**17.2**	**OAFD Protection** - test box is located adjacent to the OAFD indication box and positioned 1500mm above the adjacent floor level and is visible and accessible**.**	
Submission 1: Ref 0	**17.6**	**OAFD Protection** - in addition to the standard 30V 2 tier protection battery system, a 48V 3 tier protection battery & charger is also detailed on the design with appropriate clearances**.**	
Submission 1: Ref 0			
Submission 1: Ref 0			

Basement Chamber Substation

NS114 Electrical Design & Construction - Chamber Substation - amendment 10			Compliant
Submission 1: Ref 0	**19.2**	**Basement** - fire damper tripping is detailed on the design and the moving parts will not fall onto live equipment.	
Submission 1: Ref 0	**20.5**	**Basement - CBD Sydney** - Water Level Rise Indicator installed at the lowest point of the chamber**.**	
Submission 1: Ref 0			
Submission 1: Ref 0			

CBD Substation

Submission 1: Ref 0	**10.6**	**CBD Substation** - Basement type has two door/stairway accesses, the SCADA equipment is located in one of the lower access chambers. SCADA not installed in hatchway access.	
Submission 1: Ref 0	**10.6**	**CBD Substation** - Surface type with access chambers, SCADA is located in one of the access chambers.	
Submission 1: Ref 0	**10.6**	**CBD Substation** - Upper level type, SCADA is located in the control point or one of the access chambers**.**	
Submission 1: Ref 0	**10.6**	**CBD Substation** - 1500mm clearance in front of SCADA equipment**.**	
Submission 1: Ref 0	**10.6**	**CBD Substation** - SCADA signal marshalling box located on wall adjacent to but not behind the low voltage switchboard with the top of the box 1500mm above the chamber floor level**.**	
Submission 1: Ref 0	**12.0**	**CBD Substation** - All oil filled transformers shall be fitted with oil temperature indicators and thermostat to control the operation of the substation outlet ventilation duct fan. Dry type transformers are supplied with the indicators already fitted.	
Submission 1: Ref 0	**14.3**	**CBD Substation** - low voltage ACB's (Network Protectors) are motorised units for automatic operation.	
Submission 1: Ref 0	**20.3**	**CBD Sydney** - all HV switchgear connected to the triplex network is fitted with pull-out gear.	
Submission 1: Ref 0	**20.4**	**CBD Sydney** - ventilation fan control installed (Ausgrid drawing 32346)**.**	
Submission 1: Ref 0	**20.5**	**Basement - CBD Sydney** - Water Level Rise Indicator installed at the lowest point of the chamber**.**	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 158 - Labelling Of Mains And Apparatus - amendment 0

Submission 1: Ref 0	**7.2**	A's & B' Left to right.	
Submission 1: Ref 0	**7.5**	LV Board Distributors numbered Left to Right	
Submission 1: Ref 0	**7.7**	Distributor labelled as per naming convention.	
Submission 1: Ref 0	**7.7**	The words ‘tee’, ‘tee off’, ‘interconnected to’, ‘interconnected from’, ‘interconnector’, ‘normally open’ or ‘normally closed’ (including N/O or N/C), must not appear on distributor labels. Although normally open distributors are referred to on system diagrams.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 112 - Design Standards for Industrial/Commercial Developments

Submission 1: Ref 0		Consumers mains:	
Submission 1: Ref 0		Cable type/length - Voltage drop.	
Submission 1: Ref 0	**SIR 2.7**	Termination enclosure/MSB within 1m of boundary.	
Submission 1: Ref 0	**SIR 2.6**	No Joints.	
Submission 1: Ref 0			

Other Non Compliance Issues

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS116 Distribution Equipment Earthing - amendment 6

Compliant

Distribution Equipment Earthing

Submission 1: Ref 0	**NS104**	Each site specific earthing design (earthing electrode and cable location) is shown on the CAD Model Space at the actual asset location at a scale of 1:1 for the correct use of a Layout viewport.	
Submission 1: Ref 0	**5.2**	Standard Minimum Earthing (SME) designs complies with all of the following: • the new asset is installed downstream of an asset that is identified as SME earthing compliant • all new HV supplies, inclusive of alternate HV supply paths to the proposed distribution equipment are via underground cables • a combined earthing system is implemented • the earthing system is connected to a MEN interconnected LV street neutral • the separation distance between a telecommunications pit or pillar and the nearest earth electrode for the new asset satisfies the Telco separation distance specified.	
Submission 1: Ref 0	**7.0**	Site Specific Earthing Design is shown on the design for each proposed Substation and aligns with the issued Site Specific Earthing Report (combined/segregated earthing, electrode quantity, depth, spacing, separation).	
Submission 1: Ref 0	**7.0**	Site Specific Earthing Design is shown on the design for each proposed Pole Mounted Plant (recloser, regulator, capacitor, ABS) and aligns with the issued Site Specific Earthing Report (combined/segregated/HV only earthing, electrode quantity, depth, spacing, separation).	
Submission 1: Ref 0	**7.0**	Site Specific Earthing Design is shown on the design for each proposed HV cable UGOH and aligns with the issued Site Specific Earthing Report (HV only earthing, electrode quantity, depth, spacing, separation).	
Submission 1: Ref 0	**7.0**	Site Specific Earthing Design is shown on the design for each proposed Surge Arrestor at UGOH/HV CCT and aligns with the issued Site Specific Earthing Report (HV only earthing, electrode quantity, depth, spacing, separation).	
Submission 1: Ref 0	**7.1**	SME earthing system 1.2m separation requirement from Telco or other conductive service or structure.	
Submission 1: Ref 0	**7.1**	Where the proposed substation is within 100m of electrified rail lines a site specific earthing report has been obtained and all necessary requirements (e.g. drainage bonds, etc) detailed on the design.	
Submission 1: Ref 0	**ASP/3 Newsletter 104**	The SME earthing system has a minimum of two electrodes for each earthing group.	
Submission 1: Ref 0	**NS104**	Earth rods dimensioned from known cadastral point.	
Submission 1: Ref 0	**Site Specific Earthing Report**	MSB location compliant with the MEN separation distance detailed in the site specific earthing report.	
Submission 1: Ref 0			
Submission 1: Ref 0			

Other Non Compliance Issues

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS119 Street Lighting Design and Construction - revision 5			Compliant

NS104 Design Format & Consultation Compliance - Amendment 5

Submission 1: Ref 0	**3.8**	Standard format of the Street Lighting Construction Works Schedule Table provided.	
Submission 1: Ref 0	**4.7**	The Street Lighting Work Schedule Table details the following:- • Proposed work reference point(s) • Street Light tariff • Street Light Standard: Type, Size, Outreach • For three phase systems the proposed luminaire connected phase • Luminaire - Type, Height, Size (W) • Additional construction details • Details of removed street light(s).	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS119 Street Lighting Design and Construction - revision 5

Submission 1: Ref 0	**1.2**	Clearance between installed street lighting equipment and exposed conductors is compliant.	
Submission 1: Ref 0	**1.3**	Luminaire not longer required at pillar-standard, the pillar standard has been replaced by distribution pillar.	
Submission 1: Ref 0	**1.4**	No street light operating outside of the voltage limits **230Volts +10% and -6%.**	
Submission 1: Ref 0	**1.8**	Double insulated undergound street lighting system used.	
Submission 1: Ref 0	**1.8**	The underground street light supply extends from the nearest pillar.	
Submission 1: Ref 0	**1.8**	2core 16sqmm copper XLPE insulated and PVC sheathed cable used from pillar to standard.	
Submission 1: Ref 0	**1.8**	No more than three (3) street lights on a dedicated single phase street light circuit using 2core 16sqmm copper XLPE insulated and PVC sheathed cable.	
Submission 1: Ref 0	**1.8**	Four (4) or more street lights on a dedicated street light circuit is a three phase installation using 4core 16sqmm copper XLPE insulated and PVC sheathed cable and connected via SLCP pillar.	
Submission 1: Ref 0	**1.8**	SL loads are balanced over 3 phase and the design details the phase connection of each luminaire.	
Submission 1: Ref 0	**1.8**	Underground dedicated street light circuit controlled by a fuse. note: fuse not to exceed 32amps.	
Submission 1: Ref 0	**1.8**	Underground street light cable installed in conduit.	
Submission 1: Ref 0	**1.8**	Double insulated floodlight brackets used.	
Submission 1: Ref 0	**1.8**	Street Lighting cables shall not have underground tee joints.	
Submission 1: Ref 0	**1.8**	Tee connection must be made at an appropriate link panel in a steel column or at a dedicated connection pillar. No underground tee connections permitted.	
Submission 1: Ref 0	**2.6**	Excluding special SL designs the SL outreach arm projection at right angles to kerb and toward road centre.	
Submission 1: Ref 0	**2.7**	Steel streetlight standards are rag bolt mounted.	
Submission 1: Ref 0	**2.8**	Pedestrian Crossing Lighting: the designer shall note that the approved floodlights in Annexure A are the asymmetrical type. The design must accurately describe installation parameters to ensure that lights can be installed to the compliant design.	
Submission 1: Ref 0	**2.9**	Pedestrian crossing illumination design provided as a separate drawing or incorporated into the contestable design.	
Submission 1: Ref 0	**2.9**	The following minimum construction details for pedestrian crossing lighting shall be provided on the electrical design: • Bracket angle relative to the perpendicular of the kerb, or the parallel with the kerb, or North • Flood light upward tilt angle relative to the road surface • Flood light rotation angle relative to the traffic direction or North • Flood light height relative to the road surface • New lighting support location relative to the distance of the leading edge of the crossing and the distance behind the kerb.	
Submission 1: Ref 0	**2.9**	Location of pedestrian crossing lighting is dimensioned. • Dimensions from existing easily identifiable feature in near vicinity of crossing e.g. leading edge of crossing, kerb, existing support. • Degrees from existing easily identifiable feature in near vicinity of crossing and associated dimensions; or degrees from North and associated dimensions. • Upcast must be provided in Construction Table in separate column labelled 'Upcast'.	

NS119 Street Lighting Design and Construction - revision 5			Compliant
Submission 1: Ref 0	**2.10 NS112**	Street lighting assets located clear of personnel access to pole mounted substation and associated equipment.	
Submission 1: Ref 0	**6.5**	RRW (Reduced Roadway Width) to be used in Cul-de-sacs and where roadway width is less than 12 metres (<12m).	
Submission 1: Ref 0	**8.0**	Private lighting is not part of the design and is not installed on Ausgrid assets.	
Submission 1: Ref 0	**Annexure A**	Correct material / equipment used.	
Submission 1: Ref 0			
Submission 1: Ref 0			

Other Non Compliance Issues

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS141 Site Selection & Preparation - Kiosk Substation - Revision 5			Compliant

NS141 Site Selection & Preparation - Kiosk Substation - Revision 5

Submission 1: Ref 0	**Electricity Act**	Kiosk substation located on the development property.	
Submission 1: Ref 0	**NS104**	Kiosk Substation Details Table Provided.	
Submission 1: Ref 0	**NS104**	Correct information is detailed in the "Kiosk Substation Details" Table.	
Submission 1: Ref 0	**NS104**	Proposed kiosk substation is shown on the CAD Model Space at the actual asset location at a scale of 1:1 for the correct use of a Layout viewport.	
Submission 1: Ref 0	**1.2**	Written approval for the installation of multiple kiosks within a single premises obtained. Generally, exceeding two kiosks is not approved.	
Submission 1: Ref 0	**2.2**	Kiosk site outside an area prone to stormwater run-off.	
Submission 1: Ref 0	**2.2**	Kiosk above a declared 1 in 100 year flood level.	
Submission 1: Ref 0	**2.2**	Kiosk location is not less than 1m above the mean high water mark.	
Submission 1: Ref 0	**2.2**	Kiosk location is not in ocean front location or area.	
Submission 1: Ref 0	**2.2**	Kiosk location is not in a defined Coastal Vulnerability Areas ocean front location or area.	
Submission 1: Ref 0	**2.2**	Kiosk location is not on unstable area.	
Submission 1: Ref 0	**2.2**	Kiosk location is not in roadway restricted areas (kerb blisters or similar traffic control narrowing.	
Submission 1: Ref 0	**2.2**	Kiosk location is not on contaminated or landfill site.	
Submission 1: Ref 0	**2.2**	Kiosk substation not installed within a building, on elevated building roof, a chamber or in covered areas (parking area or garages).	
Submission 1: Ref 0	**2.2**	Kiosk substation not installed in building alcove or under roofed or partly roofed area.	
Submission 1: Ref 0	**2.2**	Top of kiosk base less than 2m above or below the access roadway level or the street footpath level adjacent to kiosk site.	
Submission 1: Ref 0	**2.2**	Kiosk substation is not in the vicinity of potentially hazardous situations such as swimming pools, petrol stations, flammable gas or liquid storage tanks.	
Submission 1: Ref 0	**2.2**	Kiosk site avoid high risk earthing situations e.g. Telstra pits, swimming pools, metallic fences unless accompanied by a compliant Site Specific Earthing Report.	
Submission 1: Ref 0	**2.2**	Kiosk sited more then 10m away from Fire Hydrant Installation.	
Submission 1: Ref 0	**2.2**	Kiosk substation not located under high voltage mains 11kV and above.	
Submission 1: Ref 0	**2.2**	Kiosk substation not located within 20m to a structure carrying 132kV overhead mains.	
Submission 1: Ref 0	**2.2**	Kiosk not sited within a railway corridor.	
Submission 1: Ref 0	**3.1 Annexure A**	The correct kiosk site dimensions met.	
Submission 1: Ref 0	**Annexure A A2.3**	Substation site with reduced dimensions is used in URD areas only.	
Submission 1: Ref 0	**3.1 Annexure D**	Pier foundations comply with Network Standard. Where non standard arrangements are proposed, designs must be accompanied by detailed drawings and structural engineering report for assessment. Drawing has references to structural engineer and drawings. **Note:** CPC to forward non standard design to David Stanbury - Development Services - Civil & Structural for approval.	
Submission 1: Ref 0	**3.3**	Substaions located on a corrner or adjacent residential allotments the permanent on-title restiction for a potential swimming pool(s) is detailed on the property rights drawing and the required separation distance complies with the issued site specific earthing report.	
Submission 1: Ref 0	**4.0**	10m radius substation site plan shown on design details: • Existing/proposed structure(s): buildings, fencing, roadways, pathways, vehicle protection, garden areas, etc • Dimensioning of the site and structures including positioning of the kiosk within the site • 3/6/10m restriction zones • Where applicable the location of the MSB.	
Submission 1: Ref 0	**4.2**	Retaining wall / Batter is outside of the standard/minimum substation site area.	
Submission 1: Ref 0	**4.2 Annexure C**	Submission of an Engineering Certificate for the proposed retaining wall.	

NS141 Site Selection & Preparation - Kiosk Substation - Revision 5			Compliant
Submission 1: Ref 0	**4.2 Annexure C**	Retaining wall constructed of durable material such as concrete or brick.	
Submission 1: Ref 0	**5.0 Annexure A**	Kiosk site is clear of other services (e.g. gas, sewer, water, telecommunication, other third party property rights, etc).	
Submission 1: Ref 0	**6.0**	Vehicle protection provided for substation site if required (e.g. bollards in car parks, adjacent to driveways, etc) and should be outside of the standard substation site area.	
Submission 1: Ref 0	**7.2**	The property rights drawing details the proposed easements, rights of way and the permanent on-title restrictions.	
Submission 1: Ref 0	**8.0**	Minimum 4.5m wide ROW provided to substation site - providing 24 hour, all weather, heavy vehicle access. Allowance to be made for vehicle turning.	
Submission 1: Ref 0	**8.0**	24 hour safe pedestrian access for Ausgrid staff direct from public roadway to substation site.	
Submission 1: Ref 0	**11.0**	Substation separated from building ventilation by not less than 6m.	
Submission 1: Ref 0	**11.5**	Pathways and fire escapes do not encroach on substation site.	
Submission 1: Ref 0	**11.5**	Structures within 3000mm of kiosk housing have a 120/120/120 FRL, unless a suitable blast proof barrier is installed.	
Submission 1: Ref 0	**11.5**	Openable and fixed window(s) located a minimum of 3m from kiosk housing unless sheltered by a blast resistant barrier.	
Submission 1: Ref 0	**11.5**	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.	
Submission 1: Ref 0	**11.5**	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.	
Submission 1: Ref 0	**12.0**	Blast resisting barrier is external to the kiosk substation site area.	
Submission 1: Ref 0	**12.0**	Blast resisting barrier is constructed of non-perishable material such as concrete or brick.	
Submission 1: Ref 0	**12.0**	Blast resisting barrier has no apertures or openings (doorways, vents, etc).	
Submission 1: Ref 0	**12.0**	An Engineers Certificate is supplied for the blast resisting barrier. The Ausgrid Distribution Design must approve the blast resisting barrier for design certification.	
Submission 1: Ref 0	**12.0**	The blast resisting barrier has a FRL of 120/120/120.	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 158 - Labelling Of Mains And Apparatus - amendment 0

Submission 1: Ref 0	**7.5**	LV Board Distributors numbered Left to Right.	
Submission 1: Ref 0	**7.7**	Distributor labelled as per naming convention.	
Submission 1: Ref 0	**7.7**	The words 'tee', 'tee off', 'interconnected to', 'interconnected from', 'interconnector', 'normally open' or 'normally closed' (including N/O or N/C), must not appear on distributor labels. Although normally open distributors are referred to on system diagrams.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 112 - Design Standards for Industrial/Commercial Developments

Submission 1: Ref 0		Consumers mains:	
Submission 1: Ref 0		Cable type/length - Voltage drop	
Submission 1: Ref 0	**SIR 2.7**	Termination enclosure/MSB within 1m of boundary	
Submission 1: Ref 0	**SIR 2.6**	No Joints	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 290 - Selection of Distribution Substations - Revision 1

Submission 1: Ref 0	**1.1**	The proposed distributon substation selected is a kiosk option listed in NS-290 Table 1.	

NS141 Site Selection & Preparation - Kiosk Substation - Revision 5			Compliant
Submission 1: Ref 0	**3.1**	K-type kiosk substation supplies only a single industrial or single commercial customer.	
Submission 1: Ref 0	**3.2**	Multiple kiosks supplying a single devlopment have a normally open 400amp LV interconnector installed between the two LV kiosk panels.	
Submission 1: Ref 0	**3.3**	No more than two kiosk substations installed adjacent to each other.	
Submission 1: Ref 0			
Submission 1: Ref 0			

Other Non Compliance Issues

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS195 High Voltage Customer Connections (HVCs) - amendment 2	Compliant

NS195 High Voltage Customer Connections (HVCs) - amendment 2

Submission 1: Ref 0	**Electricity Act**	HVC Substation located on the development property.	
Submission 1: Ref 0	**8.2**	The customer connection point is on the load side of the HV control switch.	
Submission 1: Ref 0	**8.2 Table 1**	The proposed supply arrangement aligns with an example shown in the Network Standard.	
Submission 1: Ref 0	**8.2**	Metering installation/MSB is not part of the HVC substation.	
Submission 1: Ref 0	**8.2**	Multiple HV supplies (where approved) are located in separate HVC accommodation.	
Submission 1: Ref 0	**8.2**	A 240Vac 20A single phase auxiliary supply circuit is provided from the customer's main low voltage switchboard to a chamber and/or kiosk type HVC.	
Submission 1: Ref 0	**8.3**	Only one point of supply to the Customer Installation is taken from a Ausgrid HVC.	
Submission 1: Ref 0	**8.3**	Accommodation is appropriate for the proposed type of HVC (chamber, kiosk or pole mounted).	
Submission 1: Ref 0			
Submission 1: Ref 0			

Other Non Compliance Issues

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

Network Standards related to Overhead Construction			Compliant

NS104 Design Format & Consultation Compliance - Amendment 5

Submission 1: Ref 0	**3.8**	Standard format of the Overhead Construction Works Schedule Table provided.	
Submission 1: Ref 0	**4.7**	The Overhead Construction Work Schedule Table details the following:- • The O/H design software make & version used. • Proposed work reference point(s). • Coordinates for each new pole. • Proposed pole size, strength, material, footing diameter, embedment depth. • Type, size and strength of any proposed stay wires and fittings. • The construction type/arrangement of each proposed/existing pole. • Conductor attachment height(s) at each pole. • Additional construction details.	
Submission 1: Ref 0	**4.7**	Structure Loading report(s) and PEC Calculations submitted for overhead line design.	
Submission 1: Ref 0	**4.7**	All required Stringing Tables are provided.	
Submission 1: Ref 0	**4.7**	The following Stringing Table data is correct:- • Design Span reference points. • Strain points reference points. • Ruling span. • Conductor type.	
Submission 1: Ref 0	**4.7**	The design plan details the following:- • Conductor span length on all spans required for construction (including removed spans). • Deviation angle of all conductor spans attached to a proposed pole or existing pole where loadings are being changed. • Stay angle deviation for proposed stay(s).	
Submission 1: Ref 0	**4.7**	Scaled overhead design profile included on design plan.	
Submission 1: Ref 0	**4.7**	The OH design profile details the following:- • Ground clearance(s). • Conductor profiles at maximum operating temperature(s). • Mid span circuit clearance(s). • Existing and proposed finished levels.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 109 - Design Standards for Overhead Developments - Revision 07

Submission 1: Ref 0			
Submission 1: Ref 0	**2.2**	Correct ADMD value used in voltage drop calculations.	
Submission 1: Ref 0	**2.2**	Low voltage network distributor designed maximum diversified load does not exceed 75% of its nominal 400amp rating.	
Submission 1: Ref 0	**2.3**	Maximum voltage drop at extremities of a low voltage distributor does not exceed 9V phase to earth.	
Submission 1: Ref 0	**2.3**	The new conection does not worsen the voltage drop of an existing non-complying site.	
Submission 1: Ref 0	**2.4**	Overhead low voltage distributor or network fuse does not exceed 400amps	
Submission 1: Ref 0	**2.4**	Maximum LV distributor length not exceeded (fault loop limitation),	
Submission 1: Ref 0	**2.4**	Fuse Sensitivity Calculation provided and the results indicate the criteria has been met.	
Submission 1: Ref 0	**2.4**	The new conection does not worsen the protection performance of an existing non-complying site.	
Submission 1: Ref 0	**3.1.3**	A dedicated overhead street lighting circuit is not used. Individual street lights supplied directly from the low voltage network via photo electric cells.	
Submission 1: Ref 0	**3.2.1 Table 2**	The number of UGOHs installed on a pole does not exceed the maximum allowed.	
Submission 1: Ref 0	**4.1.2**	The number of distributors taken from a pole mounted substation does not exceeed two.	
Submission 1: Ref 0	**4.1.3**	Low voltage link switches have been installed on each LV network distributor at the first pole either side of the new pole mounted substation.	
Submission 1: Ref 0	**4.1.4**	When the LV overhead network is supplied directly from a kiosk or chamber substation either an overhead link switch is installed at the UGOH pole or at ground level via a LV single link pillar.	
Submission 1: Ref 0	**4.1.5**	LV link switches installed at extremities of a LV distributor network to allow for alternate supply from adjacent/same distribution centre(s).	

Network Standards related to Overhead Construction			Compliant
Submission 1: Ref 0	**4.1.6**	Sufficient loop feeds created (sufficient interconnection between distributors from the same distribution centre or between different branches of the same distributor have been provided).	
Submission 1: Ref 0	**4.1.7**	Last pole on any radial low voltage distributor is earthed.	
Submission 1: Ref 0	**4.1.8**	Low voltage overhead network reticulation is not on private property/land.	
Submission 1: Ref 0	**8.0**	Only dedicated public roadways are used for the low voltage and street light reticulation within a Community Title development.	
Submission 1: Ref 0			
Submission 1: Ref 0	**Policy**	No new and/or replaced low voltage road crossing pole(s) (i.e. lead-in pole) permitted. Note: private poles should be installed instead.	
Submission 1: Ref 0	**Policy**	Separate service mains available to all lots in a new development without crossing over the boundary of any property other than that property for which the service is intended.	
Submission 1: Ref 0	**Design Information**	Required network connection voltage provided to proposed allotments within the subdivision Note: Lot size determines connection voltage.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 122 - Pole Mounted Substation - Amendment 5

Submission 1: Ref 0	**Electricity Supply Act**	Substation located on the development or within a dedicated public roadway.	
Submission 1: Ref 0	**NS104**	Pole Substation Details Table Provided.	
Submission 1: Ref 0	**NS104**	Correct information is detailed in the Pole Substation Details Table.	
Submission 1: Ref 0			
Submission 1: Ref 0	**7.2**	Located outside of a transmission easement.	
Submission 1: Ref 0	**7.2**	Not on 132kV, 66kV, 33kV poles.	
Submission 1: Ref 0	**7.2**	Located more than 3m from a concrete driveway (dedicated roadway location).	
Submission 1: Ref 0	**7.2**	Not in a hazardous location as detailed in NS167 - positioning poles.	
Submission 1: Ref 0	**7.2**	Not in reclaimed land, land-fill sites, wetlands or similar locations.	
Submission 1: Ref 0	**7.2**	Not at a site with an unsatisfactory evaluation of environmental impact.	
Submission 1: Ref 0	**7.2**	Within the easement or footpath allocation of another utility without the prior written permission. being obtained from the relevant utility.	
Submission 1: Ref 0	**7.2**	Located more than 40m from a waterway (unless detailed and approved in an SER).	
Submission 1: Ref 0	**7.2**	Located more than 5m from a drain.	
Submission 1: Ref 0	**7.2**	Located more than 1m above an area of high ground water.	
Submission 1: Ref 0	**7.2**	Located outside an area subject to flooding, drainage path, or stormwater ponding area.	
Submission 1: Ref 0	**7.2**	Not located on a downhill slope with greater than 10% grade.	
Submission 1: Ref 0	**7.2**	Not located within high bushfire risk area.	
Submission 1: Ref 0	**7.2**	Not located is areas where additional factors as detailed in NS167 affecting pole positioning.	
Submission 1: Ref 0	**7.2**	Substation location is not in the vicinity of potentially hazardous situations such as petrol. stations, flammable gas or liquid storage tanks etc.	
Submission 1: Ref 0	**7.6**	Provision for wet weather access to substation site for heavy vehicles (off street location).	
Submission 1: Ref 0	**7.6**	Located within a 15m wide easement (off street location).	
Submission 1: Ref 0	**7.6**	Substation site is clear of trees and vegetation.	
Submission 1: Ref 0	**7.8**	Fire evacuation routes from buildings do not encroach within 1.5m of a pole mounted substation rated upto 63kVA. 3.0m of a pole mouinted substation rated greater than 63kVA	
Submission 1: Ref 0	**7.8**	Emergency exit door from a building is directly downslope from a pole mounted substation.	
Submission 1: Ref 0	**7.8**	Any portion of a building within 3.0m of a pole mounted substation transformer is 120/120/120 fire rated.	

Network Standards related to Overhead Construction			Compliant
Submission 1: Ref 0	**7.8**	No openable or fixed windows or glass blockwork regardless of fire rating within 3m of a piole mounted substation tranformer.	
Submission 1: Ref 0	**7.8**	No outdoor storage of combustible liquids within 6.0m of a pole mounted substation.	
Submission 1: Ref 0	**7.8**	Combustible liquids storage area is directly downslope from a pole mounted substation.	
Submission 1: Ref 0	**7.8 Figure 1 Figure 2**	A 1.0m exclusion zone is provided around the pole mounted substation transformer extending vertically to ground level.	
Submission 1: Ref 0	**8.0 Table 2**	Correct HV drop out fuse selected for the fault level at the substation site.	
Submission 1: Ref 0	**8.2**	Correct substation identification code (refer Appendix B for master code list).	
Submission 1: Ref 0	**10.1**	Existing bare LV span(s) at proposed substation converted to ABC span(s).	
Submission 1: Ref 0	**10.1**	Correct pole size & strength for selected substation type and the new pole is of timber construction.	
Submission 1: Ref 0	**10.1**	A maximum Demand Indicator (MDI) installed on 3ph 100kVA and above substation except when the supplying a single customer.	
Submission 1: Ref 0	**10.2**	Stay wire is attachment 600mm above HV DOLF and has more than 350mm clearance from HV equipment.	
Submission 1: Ref 0	**10.2**	Where cross arm load limit is exceeded; stay(s) installed to counteract unbalanced load on substation LV cross arm. (Note: ASP3 to provide documentation proving that no stays are required). **Refer to drawings 228823 & 228833**	
Submission 1: Ref 0	**10.4**	Substation orientation allows for correct Network phasing (substation symbol shown with correct orientation at pole symbol).	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0	**Drawing 228821**	3ph substation pole not 12.5m when footing depth greater than 1.85m.	
Submission 1: Ref 0	**13.0**	Street lighting assets located clear of personnel access to the pole mounted substation and associated equipment	
Submission 1: Ref 0	**NS158 7.7**	Distributor labelled as per naming convention.	
Submission 1: Ref 0	**NS158 7.7**	The words 'tee', 'tee off', 'interconnected to', 'interconnected from', 'interconnector', 'normally open' or 'normally closed' (including N/O or N/C), must not appear on distributor labels. Although normally open distributors are referred to on system diagrams.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 125 - Specification for LV Overhead Conductors - Revision 5

Submission 1: Ref 0	**1.1**	Correct LV conductor type has been used.	
Submission 1: Ref 0	**1.3**	Minimum size of LV mains as per design information & loading requirements.	
Submission 1: Ref 0	**4.0**	LV mains ground clearances obtained.	
Submission 1: Ref 0	**4.0**	LV mains clearances from structures obtained.	
Submission 1: Ref 0	**4.0**	LV mains vegetation clearances obtained.	
Submission 1: Ref 0	**5.0 table 5**	Correct LV construction used (deviation angle, etc).	
Submission 1: Ref 0	**5.2**	LV ABC, the pulling tension does not exceed 4 kN.	
Submission 1: Ref 0	**Annexure A**	Deviation angle within limits detailed for proposed LV construction(s).	
Submission 1: Ref 0	**Annexure A**	Correct LV constructions nominated at pole(s).	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 126 - Specification for HV Overhead Conductors - Revision 8

Submission 1: Ref 0	**1.0**	Correct HV conductor type has been used.	
Submission 1: Ref 0	**2.0**	Minimum size of HV mains as per design information.	

Network Standards related to Overhead Construction			Compliant
Submission 1: Ref 0	**2.6**	Surge Arrestors installed at 11kV CCT-Bare transition points.	
Submission 1: Ref 0	**2.6**	If CCT-Bare transition point is an ABS. Surge arrestors installed one CCT span beyond an ABS.	
Submission 1: Ref 0	**2.7**	Design details CCT surge arrestor earthing as per NS116.	
Submission 1: Ref 0	**4.0 Annexure A**	Correct CCT constructions nominated at pole(s).	
Submission 1: Ref 0	**4.0 Annexure A**	Correct bare mains 11kV constructions nominated at pole(s).	
Submission 1: Ref 0	**4.0 Annexure A**	Correct SWER constructions nominated at pole(s).	
Submission 1: Ref 0	**4.0 Annexure A**	Deviation angle within limits detailed for proposed HV components or construction.	
Submission 1: Ref 0	**4.15**	Deviation angle within limits detailed for proposed CCT components or construction.	
Submission 1: Ref 0	**4.16**	Pole top operating devices (ABS, etc) located and orientated for safe operation. Take particular caution when selecting a site along main roads and near building awnings.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 220 - Overhead Design Manual - amendment 6

Submission 1: Ref 0			
Submission 1: Ref 0	**3.6**	75ºC maximum design temperature for 11kV mains.	
Submission 1: Ref 0	**3.6**	75ºC maximum design temperature for LV open mains.	
Submission 1: Ref 0	**3.6**	80ºC maximum design temperature for LV ABC mains.	
Submission 1: Ref 0			
Submission 1: Ref 0	**6.1**	Individual span lengths are more than half or less then double the ruling span (equivalent span).	
Submission 1: Ref 0	**6.2**	Nominated ruling span value is correct for each strain point section.	
Submission 1: Ref 0	**6.2**	Proposed conductor %UTS does not exceed allowable value for selected conductor.	
Submission 1: Ref 0	**6.2**	Is %UTS above 18% if so are Vibration Dampers installed.	
Submission 1: Ref 0	**6.2**	Is %UTS above 20% if so are Armour Rods installed along with vibration dampers.	
Submission 1: Ref 0	**8.1**	No ground stay in public roadway, pedestrian frequented area (e.g. parks, reserves, etc).	
Submission 1: Ref 0	**8.1**	Cattle barrier installed on stay wire at locations where livestock may be present.	
Submission 1: Ref 0	**10.1**	LV design clearance over a carriageway is 6.0m or greater.	
Submission 1: Ref 0	**10.1**	LV design clearance over ground other than a carriageway is 6.0m or greater.	
Submission 1: Ref 0	**10.1**	LV design clearance over lands that can not be traversed by vehicle, mobile plant or machinery is 5.0 metres or greater.	
Submission 1: Ref 0	**10.1**	LV design clearance from structures obtained.	
Submission 1: Ref 0	**10.1**	11kV design clearance over a carriageway is 7.5m or greater.	
Submission 1: Ref 0	**10.1**	11kV design clearance over ground other than a carriageway is 6.0m or greater.	
Submission 1: Ref 0	**10.1**	11kV design clearance over lands that can not be traversed by vehicle, mobile plant or machinery is 5.0m or greater.	
Submission 1: Ref 0	**10.1**	11kV design clearance from structures obtained.	
Submission 1: Ref 0	**10.3**	Separation between 11kV & LV without live line techniques is greater than 1200mm at pole.	
Submission 1: Ref 0	**10.3**	Separation between 11kV & LV with live line techniques is greater than 2500mm at pole.	
Submission 1: Ref 0	**10.3**	Minimum mid span separation between 11kV & LV obtained.	
Submission 1: Ref 0	**10.3**	Minimum separation between 11kV phases obtained at pole & mid span.	
Submission 1: Ref 0			

Network Standards related to Overhead Construction			Compliant
Submission 1: Ref 0	**10.5**	Approval obtain from the applicable Railway Corridor Management Group owner.	
Submission 1: Ref 0	**10.9 NS179**	11kV mains vegetation clearances obtained.	
Submission 1: Ref 0	**11.0**	Provide proof that software uses Ausgrid design parameters.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 167 - Positioning of Poles and Lighting Columns - amendment 3

Submission 1: Ref 0	**7.1**	Pole(s) positioned in footpath allocation as detailed in Network Standard NS130 - Annexure D.	
Submission 1: Ref 0	**7.1**	Poles are not to be located on railway property.	
Submission 1: Ref 0	**7.2**	Roadside face of pole(s) located minimum 2.5m behind kerb face of a Roads Act defined roadway (e.g. main roads , state highways, freeways, etc).	
Submission 1: Ref 0	**7.3 7.4**	For non Roads Act defined roadways, the distance from pole roadside face to kerb is correct.	
Submission 1: Ref 0	**7.7**	Pole(s) positioned to: • provide safe clearances between conductors and buildings or other structures. • address road safety factors. • avoid encroachment of overhead assets on private property without Ausgrid property rights.	
Submission 1: Ref 0	**7.10**	No more than 3 offset crossarm open wire construction poles are to be used consecutively.	
Submission 1: Ref 0	**8.0**	Hazardous locations are to be avoided (e.g. impeding vision of motorists, outside of curves, curves at crests, narrowing or narrow roadways, roundabouts).	
Submission 1: Ref 0	**9.4**	Obvious encroachments on a customer's outlook, without the customers consent must be avoided unless no other options exist, where there are scenic views involved.	
Submission 1: Ref 0	**9.5**	Poles are not to be installed through awnings unless previously approved by Ausgrid.	
Submission 1: Ref 0	**10.1**	Avoid positioning poles within 1.5m of driveways and private access ways.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 143 - Easements, Leases and Rights of Way - amendment 3

Submission 1: Ref 0	**7.2**	Minimum 10m LV easement width provided.	
Submission 1: Ref 0	**7.2**	Minimum 15m 11KV easement width provided.	
Submission 1: Ref 0	**7.2**	Minimum 15m pole mounted substation easement width provided.	
Submission 1: Ref 0	**7.2**	Sub-transmission easement width complies with AS/NZS 7000:2016 Appendix CC.	
Submission 1: Ref 0	**7.2**	Proposed property rights accommodate conductor blowout (submit calculation when spans are >100m).	
Submission 1: Ref 0	**8.1**	Where the overhead easement does not provide required access a minimum 4.5m right of way is provided to the pole mounted substation and other overhead assets.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 232 - Telecommunications Cables on Ausgrid Poles - amendment 2

Submission 1: Ref 0	**2.0**	Telecommunication cable equipment is only on network poles excluding 33kV and above.	
Submission 1: Ref 0	**3.1**	Structure loading where Telecommunications assets to be attached to be checked against original design standard.	
Submission 1: Ref 0	**3.1**	Remedial work for overloaded or overstressed structures to be undertaken to Ausgrid Standards and AS/NZS 7000:2016.	
Submission 1: Ref 0	**3.1**	All designs to include before and after (attachment of Telecommunications equipment) assessment of structure loading.	
Submission 1: Ref 0	**3.1**	Design calculations to be based on pole disk strength rating or Section 9.7 of Ausgrid Standard NS220 if pole doesn't have a pole disk.	

Network Standards related to Overhead Construction			Compliant
Submission 1: Ref 0	**3.1** **3.2**	Ground clearance determined with Telecommunications cable at maximum operating temperature which shall be at least 50deg.C.	
Submission 1: Ref 0	**3.1** **3.3**	Circuit-to-circuit (Mid-span) clearance shall be calculated with Telecommunications cable at 15deg.C and the Ausgrid conductor at maximum design temperature.	
Submission 1: Ref 0	**3.1**	Materials are on Telecommunications Approved Materials List.	
Submission 1: Ref 0	**3.2** **Table 1**	Ground clearances for Telecommunications cables with different land uses obtained.	
Submission 1: Ref 0	**3.3** **Table 3**	Clearances from electricity network infrastructure obtained.	
Submission 1: Ref 0	**3.4**	Specifies acceptable positioning for Telecommunications Co equipment on the Ausgrid overhead network.	
Submission 1: Ref 0	**3.4**	Attachment points positioned correctly on pole.	
Submission 1: Ref 0	**3.4**	Where the preferred and alternative attachment points cannot be used, approval for an exemption is sought.	
Submission 1: Ref 0	**3.4**	Where an existing network is being extended, the correct attachment points are being used.	
Submission 1: Ref 0	**3.4**	Improved access is considered during pole replacements.	
Submission 1: Ref 0	**3.4**	Attachments meet the special conditions for transformer poles.	
Submission 1: Ref 0	**3.5**	Methods of attachment at pole(s) is met.	
Submission 1: Ref 0	**3.5**	Telecommunications cables use same pole face as any existing cables.	
Submission 1: Ref 0	**3.5**	Telecommunications cables will be installed on road-side of a pole where no existing assets on side of pole.	
Submission 1: Ref 0	**3.6**	Attachment of Telecommunications equipment does not obstruct pole signage or labelling.	
Submission 1: Ref 0	**3.6**	Attachment of Telecommunications equipment does not allow or assist unauthorised climbing.	
Submission 1: Ref 0	**3.6**	Telecommunications services meet the attachment requirements.	
Submission 1: Ref 0	**3.6**	Telecommunications risers meet the attachment requirements.	
Submission 1: Ref 0	**3.6**	Powered/Unpowered ancillary equipment is in the correct position.	
Submission 1: Ref 0	**3.7**	The method of earthing or bonding the neutrals of conductive cables is appropriate.	
Submission 1: Ref 0	**3.9**	Telecommunications has supplied designs for make-ready work where required.	
Submission 1: Ref 0	**3.9**	Telecommunications has requested removal of street lighting conductors and replacement of lanterns with photoelectric cell control.	
Submission 1: Ref 0	**3.9**	Location and safety of aerial service connections considered in Telecommunications attachment locations.	
Submission 1: Ref 0	**3.11**	Designs meet requirements for pole mounted transformers and switchgear.	
Submission 1: Ref 0	**3.11**	Designs meet requirements for Air Break Switches.	
Submission 1: Ref 0	**3.11**	Telecommunications cables and assets not installed on sub-transmission or transmission structures (33kV to 132kV inclusive).	
Submission 1: Ref 0	**3.11**	Telecommunications cables and assets not installed on street light columns.	
Submission 1: Ref 0	**3.11**	Telecommunications cables and assets not installed on private poles without owner's permission.	
Submission 1: Ref 0	**3.6**	Telecommunications cable splices not installed on Ausgrid overhead network.	
Submission 1: Ref 0	**3.6**	The following notation is on the Contestable design: Service Transition Enclosures (STE) shall be installed on the pole, perpendicular to and facing away from the road. They shall be mounted a minimum of 3000mm and a maximum of 3800mm above ground. Where an existing aerial joint for the PSTN network is more than 3800mm above ground, the STE may be installed up to the same height. In no case can the STE be mounted within 1500mm of low voltage mains, or 2500mm of high voltage mains. Where two STEs are installed on the same pole, they shall be mounted one below the other, with a minimal radial offset to allow access to the reset switch."	
Submission 1: Ref 0	**3.11**	Telecommunications assets not installed in hazardous locations.	
Submission 1: Ref 0			
Submission 1: Ref 0			

Network Standards related to Overhead Construction	Compliant

Other Non Compliance Issues

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

Network Standards related to Underground Construction			Compliant

NS104 Design Format & Consultation Compliance - Amendment 5

Submission 1: Ref 0	**3.8**	Standard format of the Underground Construction Works Schedule Table provided.	
Submission 1: Ref 0	**4.8**	Underground Construction Works Schedule Table details the following:- • Any U/G design software make & version used. • Proposed work reference point(s). • Route distance(s). • Construction / joint type / asset detail(s). • Cable code(s). • Internal bending radius of conductor during & after installation. • Maximum conductor pulling tension during installation. • Additional construction details.	
Submission 1: Ref 0	**4.8**	Cable Pull Calculations submitted for underground cable routes through conduits.	
Submission 1: Ref 0	**4.8**	Ensure that a suitable cross section is provided for each trench/conduit installation/cable section.	
Submission 1: Ref 0	**NS110 Annexure A2**	Pillar internal configuration correctly specified via schematic.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 110 - Design & Construction URD - Revision 6

Submission 1: Ref 0	**2.2 and Design Information**	Correct ADMD applied to design.	
Submission 1: Ref 0	**Annexure 3**	Typical LV arrangements is correct.	
Submission 1: Ref 0	**2.2**	LV distributor(s) do not exceed 75% of distributor nominal 400amp rating.	
Submission 1: Ref 0	**2.3**	Voltage drop (in volts) detailed at extremities of LV distributor(s) on drawing and does not exceed 9 Volts (voltage drop in volts not percentage detailed at extremities).	
Submission 1: Ref 0	**2.4**	Fuse Sensitivity Calculation provided and the results indicate the criteria has been met.	
Submission 1: Ref 0	**3.1**	All LV distributor cables are direct buried excluding a crossing (driveway, roadway, easement).	
Submission 1: Ref 0	**3.1**	All direct buried LV cables in a footpath installed with 1 spare conduit (in addition to any spare 11kV spare conduits).	
Submission 1: Ref 0	**3.1**	All LV cables in a conduit installed with 1 spare conduit (in addition to any spare 11kV spare conduits).	
Submission 1: Ref 0	**3.1**	Number of services to be connected to a solid section of a LV distributor does not exceed 15.	
Submission 1: Ref 0	**3.1**	The first network service pillar on a LV distributor from a substation is a link pillar.	
Submission 1: Ref 0	**3.1**	The last network service pillar on a LV distributor from a substation is a link pillar that allows paralleling with adjacent distribution centres.	
Submission 1: Ref 0	**4.1**	Pillars located adjacent to lot boundaries.	
Submission 1: Ref 0	**4.4 Table 3**	Designed number of services from a pillar is not exceeded. • Two-Way Solid Pillar: 4x100aqmp or 1x200amp. • Three-Way Solid Pillar: 4x100amp or 1x200amp. • Single Link Pillar: 4x100amp or 1x200amp. • Double Link Pillar: 3x100amp or 1x200amp.	
Submission 1: Ref 0	**6.2**	Proposed private service pillar(s) located on private property.	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 112 - Design Standards for Industrial/Commercial Developments - Revision 5

Submission 1: Ref 0	**Annexure A**	Fuse Sensitivity Calculation provided and the results indicate the criteria has been met.	
Submission 1: Ref 0	**Service Rules**	Direct Distributor private termination enclosure/MSB located within 1m of property boundary (refer to Service and Installation Rules of NSW).	
Submission 1: Ref 0	**2.2**	The LV Network distributor(s) electrical loading does not exceed 75% of distributor nominal 400A rating.	

Network Standards related to Underground Construction			Compliant
Submission 1: Ref 0	**2.3**	Voltage drop (in volts not percentage) is detailed at extremities of LV distributor(s) on drawing and value detailed does not exceed 9 volts phase-to-earth.	
Submission 1: Ref 0	**2.3**	Direct Distributor - voltage drop calcs provided & results within limits. Maximum voltage drop of 11.5 volts phase-to-earth when the distributor is loaded at the rating of the fuse installed.	
Submission 1: Ref 0	**2.4**	Maximum LV network distibutor fuse rating is 400amps.	
Submission 1: Ref 0	**2.5 Table 3**	Route length of LV direct distrbutor does not exceed the allowed maximum for the installed fuse.	
Submission 1: Ref 0	**2.5 Table 3**	Route length of consumer mains does not exceed the allowed maximum for the installed fuse.	
Submission 1: Ref 0	**3.1**	Proposed K type kiosk or single transformer HV circuit breaker controlled substation only supplies a single customer (i.e. no multiple tenancies). Note: a shopping centre is considered to be a multiple customer, K-type not to be used.	
Submission 1: Ref 0	**3.3**	All substations sited on off-street locations on the development lot.	
Submission 1: Ref 0	**4.1**	For a Subdivision: HV cable laid in every street of the subdivision and loops in and out of cul-de-sacs.	
Submission 1: Ref 0	**4.1**	Each HV cable installed with a spare conduit for HV use only.	
Submission 1: Ref 0	**5.1**	LV distributor cables are direct buried excluding a crossing (driveway, roadway, easement, etc).	
Submission 1: Ref 0	**5.1**	For a Subdivision: LV Network distributors loop into and out of pillars (i.e. no dead end pillars).	
Submission 1: Ref 0	**5.1**	For a Subdivision: The first service pillar on a LV distributor from a substation is a link pillar.	
Submission 1: Ref 0	**5.1**	For a Subdivision: Pillars located adjacent to lot boundaries on both sides of the street.	
Submission 1: Ref 0	**5.1**	For a Subdivision: The last service pillar on a LV distributor from a substation is a link pillar that allows paralleling with adjacent distributors.	
Submission 1: Ref 0	**5.1**	For a Subdivision: Road crossing consist of a minimum of 4 conduits.	
Submission 1: Ref 0	**5.1**	For a Subdivision: Road crossing intervals not in excess of 75m.	
Submission 1: Ref 0	**5.1**	For a Subdivision: Road crossing aligned with nearest pillar.	
Submission 1: Ref 0	**5.1**	For a Subdivision: LV Network distributor cable is direct laid with 2 spare conduits on both sides of the dedicated public roadway.	
Submission 1: Ref 0	**5.1**	Dedicated customer substations provides an LV distributor connection to the LV street network	
Submission 1: Ref 0	**5.3**	Commercial / Industrial pillars (NS224) used.	
Submission 1: Ref 0			
Submission 1: Ref 0	**NS112**	LV Direct Distributor: rating does not exceed 800amps.	
Submission 1: Ref 0	**NS112**	LV Direct Distributor: the design details the fuse size, the number of cables per phase, the cable size and the route length from the distribution substation to the LV Service Protection Device within the customers incoming main switchboard.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 127 - Specifications for LV Cable Joints & Terminations - amendment 7

Submission 1: Ref 0	**3.2**	Any private electrical works shown on the contestable design is for information purposes only. Ausgrid does not specify/approve any physical installation of the private works.	
Submission 1: Ref 0	**3.4**	Max number of Service UGOHs on pole - Refer to Section 2 of the Service and Installation Rules of NSW.	
Submission 1: Ref 0	**3.5**	UGOHs on Ausgrid poles are to be placed so that the danger of vehicle impact is minimised.	
Submission 1: Ref 0	**3.7**	Service UGOHs on substation poles must not exceed 70mm2	
Submission 1: Ref 0	**3.8**	Service UGOHs in excess of 200 Amps will be via a pillar installed in the footway, where site conditions allow it, to facilitate future service connections.	
Submission 1: Ref 0	**7.0**	UGOH Construction, bare OH Mains > 66Cu/111Al to 240 AL4 XQ Z/SAC or 240 CU4 XQ Z Cables (LV 1-43) requires a link box to be installed as per LV1-7.	
Submission 1: Ref 0	**43.0**	Disconnection link box (LV5-9) shall be positioned so that when facing the link box and the building line link “1” is in the bottom left corner followed by “2”, “3”, and “4” in a clockwise direction.	

Network Standards related to Underground Construction			Compliant
Submission 1: Ref 0	**NS104**	Joint type specified for each cable joint in the underground table correctly references the applicable Network Standard joint reference e.g. HV2-27.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 129 - 11kV Joints and Terminations - Paper Insulated Lead Covered Cables - amendment 4

Submission 1: Ref 0	**NS104**	Joint type specified for each cable joint in the underground table correctly references the applicable Network Standard joint reference e.g. HV2-27.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 177 - 11kV Joints and Terminations - Polymeric Insulated Cables - amendment 13

Submission 1: Ref 0	**10.10**	UGOH erected on non-traffic side of pole (check UGOH symbol location at pole).	
Submission 1: Ref 0	**10.10**	No UGOH on concrete or steel sub transmission pole.	
Submission 1: Ref 0	**10.10**	If EFI required on the UGOH, it is in accordance with Ausgrid drawing 31318.	
Submission 1: Ref 0	**10.10**	If animal proofing of UGOH required it is in accordance with Ausgrid drawing 160354.	
Submission 1: Ref 0	**NS104**	Joint type specified for each cable joint in the underground table correctly references the applicable Network Standard joint reference e.g. HV2-27	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 130 - Specifications for Laying UG cables up to 22kV - amendment 9

Submission 1: Ref 0	**4.6**	Approval obtain from the applicable Railway Corridor Management Group owner.	
Submission 1: Ref 0	**4.6**	End of conduit banks and poles not located within railway property.	
Submission 1: Ref 0	**4.9**	Substation site is setback from street frontage: all cables on private property installed in conduit.	
Submission 1: Ref 0	**7.0**	Breaking into and removal of concrete encased duct lines is to be avoided where live cables exist in the ducts.	
Submission 1: Ref 0	**8.2**	In pit and duct systems, jointing must be carried out in pits and a relevant pit internal diagram shown with conduit penetrations.	
Submission 1: Ref 0	**10.2**	Appropriate approved conduit size is used.	
Submission 1: Ref 0	**10.6**	Proposed fibre optic conduit is only within the Ausgrid deemed strategic corridor.	
Submission 1: Ref 0	**10.9**	Thermal Stable Bedding (TSB) installed where six(6) or more power conduits installed.	
Submission 1: Ref 0	**10.12**	Concrete encased conduit requirements or reduced cover requirements met if approved.	
Submission 1: Ref 0	**10.12**	Standard depth of cover achieved.	
Submission 1: Ref 0	**10.13**	Cross sections specify appropriate bedding material to be used.	
Submission 1: Ref 0	**10.14**	The drawing details the specific concrete specification for concrete encasement of the HV conduit line(s).	
Submission 1: Ref 0	**13.6**	Joints on adjacent cables to be staggered a minimum of 1m.	
Submission 1: Ref 0	**13.6**	Joint at least 6m from road crossing, street corners, bends, driveways, concrete encased conduits, with a 2m straight section either side. Does not include cable bends into substations.	
Submission 1: Ref 0	**13.9**	Cable bending radius not exceeded.	
Submission 1: Ref 0	**13.11**	Working with asbestos ducts must be in accordance with safe working methods.	
Submission 1: Ref 0	**13.11**	Use of existing spare ducts prior approval sought and appropriate design notations used.	
Submission 1: Ref 0	**13.15**	Cable riser details shown and clamping of cables every 1m.	
Submission 1: Ref 0	**NS161 11.4 & 8.12**	Cable testing specified for "out of service" cables intended to be used.	
Submission 1: Ref 0			
Submission 1: Ref 0			

Network Standards related to Underground Construction			Compliant
NS 159 - Installation Of Cables And Conduits Using Trenchless Techniques - revision 5			
Submission 1: Ref 0	**1.6**	The design details any complex bores (>12m kerb to kerb or congested route or where cable rating review is required).	
Submission 1: Ref 0	**1.6**	The design is supported by a written endorsement from an accredited bore specialist confirming that the design can be constructed.	
Submission 1: Ref 0	**1.7**	Projects involving cables and conduits that are laid by trenchless techniques shall have a minimum depth of cover of 1m to the bore casing.	
Submission 1: Ref 0	**1.8**	Appropriate cable sizes selected.	
Submission 1: Ref 0	**3.0**	All carriageway crossings where distribution cables are installed perpendicular to the carriageway unless specifically approved by Ausgrid.	
Submission 1: Ref 0	**5.1**	Where required, grouting/methodology is submitted as a separate document to the electrical design.	
Submission 1: Ref 0	**5.1**	The grouting design includes: • Volume of grout required to fill all voids between the conduits/pipes and surrounding casing/soil for the length of the bore (i.e. the annulus volume). • Method of injecting the grout (using a tremie or other method) for the length of the bore. • Cross section drawings of the bore showing the injection method. • Method of air removal to minimise the risk of air voids from around the conduits / pipes.	
Submission 1: Ref 0	**5.2**	The method of trenchless bore is detailed on the design.	
Submission 1: Ref 0	**5.2**	Appropriate conduits selected for horizontal direction drill bores. DN63 OD, DN180mm OD, DN225mm OD SDR orange conduits.	
Submission 1: Ref 0	**5.2**	Appropriate conduits selected for case bores, micro tunnels, thrust bores or bed bores. 50mm, 100mm, 125mm, 150mm, 200mm Light Duty (LD) UPVC orange conduits.	
Submission 1: Ref 0	**5.3**	Bore spacer design adequate type/quantity/spacing.	
Submission 1: Ref 0	**5.4**	Adapters nominated if required.	
Submission 1: Ref 0	**5.5**	Bore lining nominated if required.	
Submission 1: Ref 0	**6.8**	Multiple bore holes separated by a minimum of 500mm.	
Submission 1: Ref 0	**6.10**	Frac-out risk identified and addressed as required.	
Submission 1: Ref 0			
Submission 1: Ref 0			
NS 172 - Design Requirements for Cable Jointing Pits and Vaults - amendment 7			
Submission 1: Ref 0	**6.2**	Proposed underground enclosure(s) is any of the following: • Pre-cast reinforced concrete. • Constructed in-situ reinforced concrete blockwork. • Cast in-situ reinforced concrete. • Brickwork	
Submission 1: Ref 0	**6.2**	Pre-cast reinforced concrete enclosure: designed in accordance with Ausgrid drawing 249060.	
Submission 1: Ref 0	**6.2**	Brickwork enclosure: only used in areas of rock and where area around the pit is backfilled with a sand/cement mix.	
Submission 1: Ref 0	**6.2**	In tidal areas or where an underground enclosure is below the water table pre-cast or cast in-situ reinforced concrete enclosure is used.	
Submission 1: Ref 0	**6.2**	In acid sulphate soil areas pre-cast or cast in-situ reinforced concrete enclosure is used.	
Submission 1: Ref 0	**6.3**	Underground enclosure and access covers (if applicable) meets the following: • Designed for a service life of 50 years. If specified by Ausgrid the service life of the underground enclosure shall be increased to 100 years at specific locations. • Pit and any temporary road cover for use during construction is designed to carry road loads as required by AS5100, SM1600 & HLP320. . • Consideration of special conditions (e.g. crane loads, building foundations, other services in or near, mine subsidence, buoyancy in high water table).	
Submission 1: Ref 0	**6.4**	No columns within the underground enclosure.	

Network Standards related to Underground Construction			Compliant
Submission 1: Ref 0	**6.4**	Underground enclosure(s) access and egress meets the following: • A minimum of two access points provided. • Each access point is a minimum of 900mm x 900mm. • Access points located in corner(s) of underground enclosure. • Access points located away from cable alignment and duct line entries. • Where the enclosure crosses opposing traffic lanes each lane has two access points. • Where the underground enclosure is divided into sections, every section has two access points • A minimum distance of 3m from anywhere within the enclosure to the access point ladder. • A minimum 600mm clear space adjacent to each access point for positioning of fall arrest. rescue davit system.	
Submission 1: Ref 0	**6.4**	Minimum size underground enclosure: HV 5m x 4m or 5.7m x 2m and LV 2m x 2m unless otherwise specified by Ausgrid.	
Submission 1: Ref 0	**6.4**	Underground enclosure with fixed roof has a minimum 2m internal height unless an appropriate matrix of design limits for pits and joint vaults is provided.	
Submission 1: Ref 0	**6.6**	Evidence of the pit and joint vault designer being trained as per the requirements of the SafeWork NSW Confined Spaces Code of Practice.	
Submission 1: Ref 0	**6.7**	Evidence is provided showing that access covers are designed to AS3996.	
Submission 1: Ref 0	**6.7**	Evidence is provided showing that ladders comply with AS1657 and is compatible with Ausgrid fall arrest system.	
Submission 1: Ref 0	**6.7**	Standard vertical ladder and retractable handrails used as per Ausgrid drawing 49813 & 120488.	
Submission 1: Ref 0	**6.7**	Galvanised pulling eyes installed in suitable locations to cater for incoming cable ducts and access hatches are in accordance with drawing 63678 and designed to resist 50 kN Safe Working Load.	
Submission 1: Ref 0	**6.7**	Provision made to allow for accommodation of planned number of cables and/or joints, copper pilots or fibre, via appropriately sized cable support brackets.	
Submission 1: Ref 0	**6.8**	Structural drawings of proposed underground enclosure certified by a Structural Engineer.	
Submission 1: Ref 0	**6.8**	Structural drawings and certification for Pit/Vault design submitted.	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 224 - Low Voltage UG Distribution Utilising Pillars - amendment 2

Submission 1: Ref 0	**1.0**	Only NS224 pillar(s) used in a commercial/industrial area.	
Submission 1: Ref 0	**8.1**	Correct NS224 pillar configuration and schematic detailed on design.	
Submission 1: Ref 0	**11.2**	Correct distributor cable type and size used (maximum 300AL or 240CU).	
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 234 - Telecommunications Underground Physical Plant Installation - amendment 2

Submission 1: Ref 0	**5.7**	Minimum 63mm OD HD orange conduit detailed for the fibre network.	
Submission 1: Ref 0	**5.7**	900mm and/or 1200mm conduit bends specified for the fibre network.	
Submission 1: Ref 0	**5.7**	Ausgrid approval obtained for the use of existing spare feeder conduits for the fibre network.	
Submission 1: Ref 0	**5.8**	Minimum 900mm depth of cover provided for the fibre network.	
Submission 1: Ref 0	**5.10**	Fibre optic route not more than 300m in length with no more than a cumulative total bending radius of 180° between pits.	
Submission 1: Ref 0	**5.10**	Fibre optic cable hauling calculations provided.	
Submission 1: Ref 0	**5.16 NS204**	Fibre optic pit(s) requirements met.	
Submission 1: Ref 0	**5.21 NS235**	Fibre Optic UGOH requirements met.	
Submission 1: Ref 0	**5.25**	Proposed OPGW to UGFO transition (splice) is on a pole (OPGW does not come to ground).	
Submission 1: Ref 0	**5.25**	Correct UGFO cable type nominated for underground fibre optic route.	
Submission 1: Ref 0			
Submission 1: Ref 0			

Network Standards related to Underground Construction	Compliant

Requirements for Direct Distributors

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

Other Non Compliance Issues

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

Network Standards related to Sub-Transmission Overhead Construction			Compliant

NS 001 -

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 135 - Construction of 33kV, 66kV and 132kV Overhead Mains - amendment 3

Submission 1: Ref 0	4.1	Correct overhead construction types detailed.	
Submission 1: Ref 0	4.2 Design Brief	Correct overhead conductor size(s) detailed.	
Submission 1: Ref 0	4.3	Correct cross-arm(s) and construction and material detailed.	
Submission 1: Ref 0	4.4	Correct pole selection and position detailed.	
Submission 1: Ref 0	4.6	Correct line switch(es) detailed.	
Submission 1: Ref 0	4.6	Line switches located in an accessible location.	
Submission 1: Ref 0	5.0	Ausgrid network standard variation approval obtained for the installation of mains within zone and transmission substations.	
Submission 1: Ref 0	6.1	Earth fault assessment provided.	
Submission 1: Ref 0	6.2	No sub-transmission earthing within 20m of distribution earthing unless approved by Ausgrid.	
Submission 1: Ref 0	7.1	All new OHEW are OPGW	
Submission 1: Ref 0	7.1	One OHEW for each 132kV circuit is provided.	
Submission 1: Ref 0	7.1	OHEW is erected for the whole route/line length.	
Submission 1: Ref 0	7.1	Minimum OHEW length requirements for existing/refurbished 33kV and 66kV lines from substations connected to sub-transmission O/H lines obtained.	
Submission 1: Ref 0	7.1	At least two OHEW's used on horizontal multi-pole constructions.	
Submission 1: Ref 0	7.2	The correct OPGW fibre optic cable name/number detailed.	
Submission 1: Ref 0	7.4	Consideration given to telecommunication facilities in the vicinity of UGOH structures, telephone exchanges near new lines, and copper communications lines running parallel to sub-transmission lines for distances greater than 100 metres.	
Submission 1: Ref 0	7.4	Where OPGW lines are to be constructed close to or crossing rail corridors, existing railway communications circuits considered.	
Submission 1: Ref 0	9.4	Railway crossing meets the requirements of Ausgrid Network Standard NS220.	
Submission 1: Ref 0	9.5	Navigable waterway crossing meets the requirements of Ausgrid Network Standard NS220.	
Submission 1: Ref 0	9.8	Staying of a pole(s) meets the requirements of Ausgrid Network Standard NS220.	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 003 -

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

Other Non Compliance Issues

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

Network Standards related to Sub-Transmission Underground Construction			Compliant

NS 001 -

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 168 - Design and Construction of 33kV, 66kV and 132kV Underground Cables - amendment 8

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0	10.2	Correct 132kV cable type for situation.	
Submission 1: Ref 0	10.2	Correct 66kV cable type for situation.	
Submission 1: Ref 0	10.2	Correct 33kV cable type for situation.	
Submission 1: Ref 0	10.3	Correct 132kV cable accessories detailed for situation.	
Submission 1: Ref 0	10.3	Correct 66kV cable accessories detailed for situation.	
Submission 1: Ref 0	10.3	Correct 33kV cable accessories detailed for situation.	
Submission 1: Ref 0	10.4	Link Box fabricated from stainless steel.	
Submission 1: Ref 0	10.4	Along the cable route, the link boxes have been installed in suitable concrete link box pits located in the footpath/nature strip adjacent to the cable jointing bay/pit/vault.	
Submission 1: Ref 0	10.4	The internal depth of the link box pit is 700 – 900mm.	
Submission 1: Ref 0	10.4	The link box pit has a minimum clearance distance of 200mm from the link box on the side of the bonding lead entries and 150mm on the other sides.	
Submission 1: Ref 0	10.5	Sheath voltage limiters (SVLs) at cable terminations or bonding points meet Ausgrid specification.	
Submission 1: Ref 0	10.6	Distributed Temperature Sensing (DTS) fibre conduits and pits detailed for all new sub-transmission feeder installation.	
Submission 1: Ref 0	10.6	DTS fibre pits located in the footpath wherever possible, and away from power cable jointing bays, pits and vaults.	
Submission 1: Ref 0	10.8	Cables installed within State roads designed with a minimum cover depth of 1m within the carriageway and 900mm cover outside the carriageway (e.g. footpath & driveways).	
Submission 1: Ref 0	10.8	Cables installed in Regional and Local (non-classified) road reserves designed with a minimum cover depth of 750mm within both the carriageway and non-carriageway areas.	
Submission 1: Ref 0	10.8	Cables laid at shallow depths to cross obstructions, have an absolute minimum cover depth of 500mm. Steel plate protection shall be installed instead of polymeric cover strips wherever the cover depth is between 500mm and 750mm.	
Submission 1: Ref 0	10.8	Documented risk assessment provided for special cable situations (e.g. cables run through structures) for Ausgrid approval.	
Submission 1: Ref 0	10.9	The following trench design constraints meet: • A minimum of 100mm of TSB material above, beneath and around the power cables or conduits. • Polymeric cover strips installed over the entire trench width 100mm above the top conduit. • TSB, DGB20 road base or similar backfill material with an appropriate thermal resistivity installed above the polymeric cover strips to the underside of pavement. • Adequate separation between conduits to allow TSB flow. • TSB backfill shall meet the requirements of NS130. • Warning tapes installed at the bottom of the road subbase, at a typical cover depth of 300 - 400mm.	
Submission 1: Ref 0	10.10	Minimum 100mm conduits detailed for: • 33kV 1c cables up to 630mm².	
Submission 1: Ref 0	10.10	Minimum 150mm conduits detailed for: • 33kV 1c cables 800mm² and larger. • 33kV 3c cables up to 400mm². • 132kV cables with 16mm XLPE insulation & smooth aluminium sheath up to 1600mm².	
Submission 1: Ref 0	10.10	Minimum 200mm conduits detailed for: • 33kV 3c cables 500mm² and larger. • All other 132kV cables.	
Submission 1: Ref 0	10.10	Conduit bends have 6m bend radius.	

Network Standards related to Sub-Transmission Underground Construction			Compliant
Submission 1: Ref 0	10.10	Correct conduit spacers detailed for all new installations.	
Submission 1: Ref 0	10.10 NS234	Correct conduit sizes for telecommunication and DTS cables detailed.	
Submission 1: Ref 0	10.11	Minimum separation of 300mm from other services and cables detailed.	
Submission 1: Ref 0	10.13	Proposed transmission cable joint(s) located within a joint bay.	
Submission 1: Ref 0	10.13 NS172	Proposed joint bay and joint vault meet Ausgrid network standard requirements.	
Submission 1: Ref 0	10.13	Joint bay depth does not exceed the maximum of 2m.	
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

NS 003 -

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			

Other Non Compliance Issues

Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			
Submission 1: Ref 0			