

Design Certification Check Sheet

1 March 2021

Project ID:			
Project Details:			
Submission Date:		Submission Number:	1
ASP3 Designer:			
ASP3 Email:			
ASP 3 Company:			
ASP/3 Ausgrid ID			
ASP/3 Partner ID			

NS104 Design Format & Consultation Compliance	Compliant
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Design Submission - Documentation

Documentation:1-0	Design Information validity period still current	
Documentation:1-0	ASP3 Company accreditation valid at time of design certification submission	
Documentation:1-1	ASP3 Designer is an Ausgrid authorised designer	NO
Documentation:1-0	Designer Safety Report attached	
Documentation:1-0	ASP3 - Design Deed Poll (Contract for Design Related Services - Appendix 1) - signed and attached. An electronic copy is acceptable to proceed with design checking.	
Documentation:1-0	The SER submitted to ESU and confirmation email from ASP3 received.	
Documentation:1-0	The appropriate notification letters issued (a design cannot be certified or EIA verified until notice periods have expired)	
Documentation:1-0	A completed Asset Valuation Sheet (AVS) attached	
Documentation:1-0	Completed street lighting form AUSPL CON F01A from Street Lighting Customer (eg Local Council) attached	
Documentation:1-0	Design in *.dwg or *.dgn format and submitted as a single CAD file note: ie merge all referenced files into one CAD file	
Documentation:1-0	LV voltage drop calculations for subdivision(s), LV direct distributors	
Documentation:1-0	Structure Loading report(s) and PEC Calculations submitted for overhead line design	
Documentation:1-0	Duct Pull Calculations submitted for underground cable routes through conduits	
Documentation:1-0	Completed Customer Detail Form attached	
Documentation:1-0	Architectural Lock-in Drawings for chamber design submitted	

NS104

NS104:1-0	Design is legible.	
NS104:1-0	Correct use of Model, Layouts and Layers. Only the provided 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. Viewports reference the Model space with appropriate use of layers to create desired layout drawings.	
NS104:1-0	"Check for other services before boring or excavating" notation placed on plan. One notation on the main design plan is sufficient, however, it can be shown on each sheet of the design	
NS104:1-0	"This information includes data from the NSW digital cadastral database by Land & Property Information ©2016. Used under creative commons licence version 4.0" notation placed on plan if the land base used is supplied by Ausgrid.	
NS104:1-0	Standard Symbols used where symbols have been provided in the CAD template. Symbol Legend reflects symbols used	
NS104:1-0	Drawing scaled correctly. Ensure that a scale bar is provided with each design layout and inset drawing and that scaling appears accurate.	
NS104:1-0	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	
NS104:1-0	Ausgrid standard CAD template formats used. The intent is to check that appropriate title block, tables and notes provided in the CAD template are used and are accurately populated.	
NS104:1-0	Project location is identifiable. Generally looking for street names, nearest cross street and relevant street/lot numbers or alternatively a locality plan.	
NS104:1-0	Existing & proposed Asset numbering shown & correctly labelled	
NS104:1-0	Asset number and correct symbol shown on design for existing, removed and proposed assets	
NS104:1-0	Proposed & existing assets accurately dimensioned & correctly referenced to known cadastral point. The intent is to provide a suitable dimension for new assets being installed (eg poles, pillars, substation, joints, road crossings etc)	
NS104:1-0	HV Schematic or System Diagram provided and correct with correct connectivity with respect to construction drawing (including distances from known nodes)	
NS104:1-0	LV Schematic or LV Network Diagram provided and correct (Geo-Schematic format)	
NS104:1-0	SL Schematic provided and correct (Geo-Schematic format)	
NS104:1-0	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.	
NS104:1-0	HV & LV sides of kiosk substations are readily identifiable on the design	
NS104:1-0	Compliance with access requirements to site. Provision of suitable evidence on the design that network standard access requirements are being complied with	
NS104:1-0	Ensure that all sub-transmission within the vicinity of the works is shown and all crossings are detailed	
NS104:1-0	Site Specific Earthing Report specifications included on the design	
NS104:1-0	O/H design software make & version details	
NS104:1-0	Scaled overhead design profile included on design plan	

NS104 Design Format & Consultation Compliance		Compliant
NS104:1-0	Span lengths included on design	
NS104:1-0	Line deviation angle for each pole	
NS104:1-0	Mid span circuit clearances detailed on drawing	
NS104:1-0	Exist & proposed finished levels	
NS104:1-0	Stringing Tables provided and correct	
NS104:1-0	Ensure that a suitable cross section, including shared trenching where applicable, is provided for each trench/conduit installation at each cable section	
NS104:1-0	Joint type specified for each cable joint in the underground table correctly references the applicable Network Standard joint reference eg HV2-27	
NS104:1-0	Pillar internal configuration correctly specified via schematic	
NS104:1-0	Detail of buildings, retaining walls, bollards, etc specified if relevant. Where applicable detailed drawings and structural engineering reports to be provided	
NS104:1-0	Elevations showing ground slope(s) adjoining kiosk, building, retaining wall, level change, etc. Existing and proposed finished levels to be shown	
NS104:1-0	Suitable property rights plan provided that shows existing and proposed property rights (easements, leases, rights of ways are applicable)	
NS104:1-0	No work proposed on existing Ausgrid assets within a private property without suitable tenure being established	
NS104:1-0	Has the SER been adequately prepared	
NS104:1-0	Does the design accurately reflect the current Design Information provided	
NS104:1-0	Has due consideration been given to checking for overdesign	
NS104:1-0	Distribution assets are not over-utilised	

Other Non Compliance Issues

NS104-Other:1-0		
NS104-Other:1-0		
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NS104-Other:1-0		

NS113 Site Selection & Construction - Chamber Substation		Compliant
NS113:1-0	Chamber substation located on the development property	
NS113:1-0	Sect 5: Chamber substation meets FRL for type of transformer equipment installed	
NS113:1-0	Sect 6: Surface Chamber - floor RL not more than 2000mm above the lowest access finished surface RL	
NS113:1-0	Sect 6: Elevated Chamber - floor RL is between 2000mm and 6000mm from access finished surface	
NS113:1-0	Sect 6: Elevated Chamber - has no oil filled equipment	
NS113:1-0	Sect 6: Elevated chamber - All switching equipment is within the chamber	
NS113:1-0	Sect 6: Upper Level Chamber - floor RL more than 6000mm above the lowest the access finished surface RL	
NS113:1-0	Sect 6: Upper Level Chamber - has no oil filled equipment	
NS113:1-0	Sect 6: Basement Chamber - located on the first useable level below constructed final ground level	
NS113:1-0	Sect 6: Basement Chamber - floor RL not exceeding 4.3m below access point ground level RL	
NS113:1-0	Sect 6: Basement Chamber - located in Sydney Metro area	
NS113:1-0	Sect 6: HVC - No customer metering or any other customer equipment installed in the chamber	
NS113:1-0	Sect 7: 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	
NS113:1-0	Sect 7: Selected substation/access not within a hazardous area as defined in AS/NZS3000	
NS113:1-0	Sect 7: Selected substation/access not within a confined space area	
NS113:1-0	Sect 7: Selected substation/access not within an area that increases the risk of fire, explosion or other environmental issue	
NS113:1-0	Sect 7: Selected substation/access not within an area(s) that will be utilised for possible storage or collection area for combustible or dangerous materials or goods	
NS113:1-0	Sect 7: Ausgrid property rights cover the full length and area of the ventilation ducts from the substation chamber or control point chamber.	
NS113:1-0	Sect 7: Upper Level - All accesses through buildings must be subject to an approved and registered Right of Way (ROW) and is unimpeded seven days a week	
NS113:1-0	Sect 8: 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	
NS113:1-0	Sect 8: Both substation chamber access doors should be diagonally opposite or at either extreme of the Chamber Substation	
NS113:1-0	Sect 8: Dedicated access ways 1200mm wide	
NS113:1-0	Sect 8: Doors between personnel access chambers and TX chamber are to be 120mm step down	
NS113:1-0	Sect 8: Doorways provide a minimum clear opening of 2400mm high and 1000mm wide when the door is in the fully open position	
NS113:1-0	Sect 8: Each doorway leading from an access chamber into a substation chamber is to have a step of 120mm at the threshold of the doorway	
NS113:1-0	Sect 8: Minimum 4 metres (clear) headroom required along entire vehicle route to and from the transformer handling and vehicle manoeuvring areas	
NS113:1-0	Sect 8: No access through areas deemed dangerous (eg guard dogs, operations involving vehicles, machinery & equipment)	
NS113:1-0	Sect 8: No access through enclosed area or courtyard other then those dedicated to the chamber	
NS113:1-0	Sect 8: Personnel access chambers must have a minimum headroom of 2500mm and a minimum width of 1200mm	
NS113:1-0	Sect 8: Personnel Doors are to be 120 -190mm step up from outside the chamber	
NS113:1-0	Sect 8: Positioning of any pulling rings is to provide straight pulls, clear of any pieces of equipment which do not obstruct doorways or hatches	
NS113:1-0	Sect 8: Stairways must be not less than 1200mm wide and headroom must be a minimum of 2200mm	
NS113:1-0	Sect 8: Structural component ratings of Chamber and access corridor are FRL 180/180/180 and 2kPa blast rating	
NS113:1-0	Sect 8: 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	
NS113:1-0	Sect 8: Transformer doors are 120-600mm step up from outside the chamber	
NS113:1-0	Sect 8: Transformer doors are the full height of the chamber and 1700mm wide	
NS113:1-0	Sect 8: Surface Chamber - Two dedicated doorways/stairways with 24 hour access from public street	
NS113:1-0	Sect 8: Upper Level - 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		Compliant
NS113:1-0	Sect 8: Upper Level - 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	
NS113:1-0	Sect 8: Elevated & Basement - At least one of the personnel access ways must also incorporate a vertical shaft of at least 1600mm x 900mm	
NS113:1-0	Sect 8: Elevated & Upper Level - 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 180/180/180	
NS113:1-0	Sect 8: Basement - Hatchway lower access chamber is a minimum of 3500mm x 1600mm	
NS113:1-0	Sect 8: Basement - Hatchway must have a minimum opening of 1410mm x 880mm	
NS113:1-0	Sect 8: Basement - 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	
NS113:1-0	Sect 8: Basement - Centre of the transformer hatch is within 5.2 metres of an all-weather access roadway	
NS113:1-0	Sect 8: Basement - 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	
NS113:1-0	Sect 8: Basement - Hatch covers positioned with minimum 1m clearance to any wall or other part of the building in the direction of entry. Clearance of at least 300mm is provided on at least one other side of the hatch cover.	
NS113:1-0	Sect 8: Basement - Location of deep sump (300x300x300mm) is shown on design & complies	
NS113:1-0	Sect 8: Basement - Minimum clear head clearance above hatch covers is 3.2 metres.	
NS113:1-0	Sect 8: Basement, Elevated & Upper Level Control Point - Two dedicated stairways with 24 hour access from public street	
NS113:1-0	Sect 8: Basement & Elevated - Upper and lower access chambers must incorporate a landing of not less than 1600mm x 1600mm, to facilitate moving and turning of equipment	
NS113:1-0	Sect 8: CBD Substation - SCADA equipment must not be installed in any access chamber intended for small equipment access (allowed in personnel access chambers only)	
NS113:1-0	Sect 8: CBD Substation - 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.	
NS113:1-0	Sect 9: All areas nominated for the purpose of ventilating the substation are to terminate on an external face, to free open air	
NS113:1-0	Sect 9: 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.	
NS113:1-0	Sect 9: Surface - Transformer access doors are to be used for ventilation and constructed as weatherproof aluminium louvres in accordance with Ausgrid Drawing 43140	
NS113:1-0	Sect 9: Elevated & Upper Level - Where located on the outside face of the building the entire outside wall is to be fully louvered	
NS113:1-0	Sect 9: Basement - Dedicated inlet and outlet ventilation ducts required with minimum cross sectional areas as specified in the Network Standard	
NS113:1-0	Sect 9: CBD Substation - Dedicated inlet and outlet ventilation ducts required with a SCADA monitored fan fitted into the substation end of the outlet ventilation duct	
NS113:1-0	Sect 9: The aspect ratio of ventilation ducts is not to exceed 4:1 and duct lengths must not exceed 10 metres	
NS113:1-0	Sect 9: External duct inlet and outlet openings on a building are not be separated by less than 6 meters, measured in a direct line in free air or around wall faces	
NS113:1-0	Sect 9: The bottom edge of any duct opening is to be no less than 3 metres above any area where pedestrian traffic can be anticipated	
NS113:1-0	Sect 9: For internal duct inlet & outlet openings, the bottom of one of the ducts is to terminate 120mm to 190mm above finished chamber floor level	
NS113:1-0	Sect 9: Internal duct inlet & outlet openings must be positioned so that the transformers are located in cross-flow ventilation between the openings	
NS113:1-0	Sect 9: Any portion of ventilation ducts located inside the substation or control point chamber must be constructed of sheet metal, subject to the fire damper being placed against the end of the concrete / concrete block section	

NS113 Site Selection & Construction - Chamber Substation		Compliant
NS113:1-0	Sect 9: 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 are not considered as building ventilation)	
NS113:1-0	Sect 10: 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	
NS113:1-0	Sect 10: 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	
NS113:1-0	Sect 11: Minimum concrete encasement of 150 mm for any conduit which is located in any void between the finished substation floor slab and structural slab	
NS113:1-0	Sect 11: Pits of depth equal to, or greater than, 1.0m must have ladders that are permanent and compliant with AS 1657.	
NS113:1-0	Sect 11: At least one conduit is required for each cable group function, eg protection, LV board earthing, service board power and earthing	
NS113:1-0	Sect 11: 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	
NS113:1-0	Sect 11: 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	
NS113:1-0	Sect 11: 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.	
NS113:1-0	Sect 11: A water service is to be installed on a wall in a position away from switchgear and the switchboard	
NS113:1-0	Sect 12: 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	
NS113:1-0	Sect 12: 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.	
NS113:1-0	Sect 13: Installation of EMI screening is not permitted inside any Chamber Substation, at any HVC connection, or associated chambers and cable risers	
NS113:1-0	Sect 13: 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	
NS113:1-0	Sect 14: 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	
NS113:1-0	Sect 14: An Engineering Certification must accompany all applications for service supply involving cable risers confirming compliance with BCA fire requirements	
NS113:1-0	Sect 14: 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)	

Other Non Compliance Issues

NS113-Other:1-0		
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NS114 Electrical Design & Construction - Chamber Substation		Compliant
NS114:1-0	NS149: In addition to the general NS104 requirements, the chamber design must also contain an equipment layout plan, pit and duct layout (including conduit schedule), lighting and power layout plan, earthing plan, information plan and a separate set of lock-in drawings in accordance with NS149	
NS114:1-0	Sect 8: Chamber substation not located adjacent to, above or below operating theatres or similar areas where sensitive instrumentation is to be installed (EMF)	
NS114:1-0	Sect 8: No magnetic shielding inside chamber enclosure	
NS114:1-0	Sect 8: Operator locker installed in each chamber with appropriate clearances	
NS114:1-0	Sect 8: Fire extinguishers located inside each entrance to each chamber and control point chamber	
NS114:1-0	Sect 9: Each oil filled transformer has a space 2000mm x 2100mm	
NS114:1-0	Sect 9: Each dry type transformer has a space 2200mm x 1525mm	
NS114:1-0	Sect 9: Each transformer space has 1000mm clearance from walls, other equipment, pit edges or obstructions and 1000mm separation from any other transformer space	
NS114:1-0	Sect 9: 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	
NS114:1-0	Sect 9: Separate HV transformer tail conduit outlet located immediately inside the designated transformer space and centrally under the respective cable termination point	
NS114:1-0	Sect 9: 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).	
NS114:1-0	Sect 9: All conduit openings clear of the path required for installation or removal of any transformer	
NS114:1-0	Sect 9: Transformer(s) not placed directly under ventilation duct openings	
NS114:1-0	Sect 9: No item, equipment or obstruction other than fire damper trip wires placed over a designated transformer space	
NS114:1-0	Sect 9: Installation or removal of a transformer can be done without moving or de-energising any equipment, structure, cable associated with any other transformer.	
NS114:1-0	Sect 9: Clearance not less than 1100mm from all equipment is met during all stages in the movement of a transformer	
NS114:1-0	Sect 9: Each transformer in a surface or elevated chamber is located directly in front of a transformer access door	
NS114:1-0	Sect 9: Sufficient clear space to manoeuvre each HV switch via the personnel access door to the associated HV pit	
NS114:1-0	Sect 9: HV pit dimensions comply with Ausgrid drawing 191085	
NS114:1-0	Sect 9: HV switch positioned with it operating side placed along the longer pit dimension	
NS114:1-0	Sect 9: Pit dimension accommodates the bending radii of proposed cables	
NS114:1-0	Sect 8: Prior approval from Ausgrid obtained for larger pit dimensions	
NS114:1-0	Sect 9: 1500mm clearance between front edge of HV pit and any wall or obstruction	
NS114:1-0	Sect 9: 2000mm clearance between front edge of HV pit and the front of a "E-type" switchboard (or 2600mm for "H-type")	
NS114:1-0	Sect 9: Not less than 1000mm from back or side of the HV switchgear to any wall or obstruction	
NS114:1-0	Sect 9: Not less than 1000mm clearance between side connected HV switches	
NS114:1-0	Sect 9: 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	
NS114:1-0	Sect 9: Fused Strip Type LV Board - clearances met (single transformer chamber Ausgrid Drawings 224407 or 224408)	
NS114:1-0	Sect 9: "E-Type" LV Board - clearances met (Ausgrid Drawing 178228)	
NS114:1-0	Sect 9: "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).	
NS114:1-0	Sect 9: "E-Type" LV Board - front edge of the pit not less than 1000mm in front of a chamber wall	
NS114:1-0	Sect 9: "E-Type" LV Board - no part of the panel is closer then 1500mm to the nearest wall edge of an access doorway or opening	
NS114:1-0	Sect 9: "E-Type" LV Board - no part of the panel or associated components is closer then 1500mm to the nearest wall edge of an access doorway or opening	
NS114:1-0	Sect 9: "E-Type" LV Board - the space above the area of the panel LV pit up to 1000mm around the outside edge of LV pit must be clear of ventilation duct opening, ventilation duct or other installation or equipment, other than busbars, cables and OAFD equipment.	

NS114 Electrical Design & Construction - Chamber Substation		Compliant
NS114:1-0	Sect 9: "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	
NS114:1-0	Sect 9: "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	
NS114:1-0	Sect 9: SCADA Equipment - fitted to CITY CBD substations, OAFD substations or as specified by Ausgrid	
NS114:1-0	Sect 9: 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.	
NS114:1-0	Sect 9: CBD Substation - Surface type with access chambers, SCADA is located in one of the access chambers.	
NS114:1-0	Sect 9: CBD Substation - Upper level type, SCADA is located in the control point or one of the access chambers	
NS114:1-0	Sect 9: CBD Substation - 1500mm clearance in front of SCADA equipment	
NS114:1-0	Sect 9: 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	
NS114:1-0	Sect 9: 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.	
NS114:1-0	Sect 9: 1500mm clearance in front of equipment mounted on a protection panel	
NS114:1-0	Sect 9: 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.	
NS114:1-0	Sect 9: the 48V protection battery charger is 1500mm above the chamber floor level	
NS114:1-0	Sect 9: 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	
NS114:1-0	Sect 9: protection battery not located in close proximity to protection panels or control equipment (eg SCADA) where battery vapour may increase the risk of corrosion.	
NS114:1-0	Sect 9: battery test box mounted with OAFD indication panel adjacent to the substation access door and is readily visible and accessible.	
NS114:1-0	Sect 9: the HV earth fault indicators(EFI) and associated CTs are mounted on the RHS of the HV switchgear (ie "outgoing" connection)	
NS114:1-0	Sect 9: 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	
NS114:1-0	Sect 9 & 10: HV switches operating side is not the nearest side to the associated transformer	
NS114:1-0	Sect 11: 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.	
NS114:1-0	Sect 12: transformer cables size and number of cables is compliant	
NS114:1-0	Sect 13: low voltage panel configuration aligns with design information and is accurately represented in the equipment layout of the design	
NS114:1-0	Sect 13: CBD Substation - low voltage ACB's (Network Protectors) are motorised units for automatic operation.	
NS114:1-0	Sect 13: "E-Type" LV Board - LV pit steelwork to be installed to Ausgrid drawing 178229	
NS114:1-0	Sect 13: "E-Type" LV Board - if the LV board is to be extended at a later date, the LV surge arrester not installed on the end that is to be extended	
NS114:1-0	Sect 13: "E-Type" LV Board - if the bus section panel is normally open, a LV surge arrester panel is installed at each end of the LV board	
NS114:1-0	Sect 13: "E-Type" LV Board - the LV surge arrester panel is installed at LV board end closest to the protection and service panels	
NS114:1-0	Sect 14: No more than 2 busbar supplies connected to the LV switchboard	
NS114:1-0	Sect 14: customers' consumer mains cable size and number of cables is compliant	
NS114:1-0	Sect 14: 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	
NS114:1-0	Sect 14: 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	
NS114:1-0	Sect 15: requirements of Site Specific Earthing Report detailed on design.	

NS114 Electrical Design & Construction - Chamber Substation		Compliant
NS114:1-0	Sect 15: a combined earthing system consists of two groups of electrodes labelled "A Group" and "B Group" with correct number and positioning of electrodes	
NS114:1-0	Sect 15: earth electrode groups independently connected to substation earth bar	
NS114:1-0	Sect 15: earth electrode locations full dimensioned on the layout of equipment drawing	
NS114:1-0	Sect 15: 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	
NS114:1-0	Sect 15: 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)	
NS114:1-0	Sect 15: correct earth cable(s) specified for the connection to the substation earth bar for all metalwork (eg cable support brackets, mechanical protection devices) not attached to a transformer	
NS114:1-0	Sect 15: correct earth cable(s) specified and proposed for the connection to a nearby substation or un-associated control point	
NS114:1-0	Sect 15: location of the substation earth bar (or control point earth bar, where applicable) is shown on the design	
NS114:1-0	Sect 15: all substation equipment earths are connected to the substation earth bar	
NS114:1-0	Sect 16: protection requirements comply with design information	
NS114:1-0	Sect 16: OAFD Protection - specified for a multi transformer substation outside Sydney CBD area	
NS114:1-0	Sect 16: OAFD Protection - HV RMICBs and LV ACBs provided with two trip coils	
NS114:1-0	Sect 16: OAFD Protection - indication box (Ausgrid drawing 227354) installed on chamber internal wall adjacent to the main personnel entrance to substation	
NS114:1-0	Sect 16: 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	
NS114:1-0	Sect 16: 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	
NS114:1-0	Sect 16: maximum of 1200mm to top of battery from chamber floor level	
NS114:1-0	Sect 17: Fluorescent style lighting provides a minimum of 160 Lux throughout the horizontal plane 1000mm above the floor level	
NS114:1-0	Sect 17: 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.	
NS114:1-0	Sect 17: 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.	
NS114:1-0	Sect 18: Basement - CO2 is not located in the ventilation system and the CO2 point of entry is in an accessible location for the fire brigade	
NS114:1-0	Sect 18: Basement - fire damper tripping is detailed on the design and the moving parts will not fall onto live equipment	
NS114:1-0	Sect 19: CBD Sydney - all HV switchgear connected to the triplex network is fitted with pull-out gear	
NS114:1-0	Sect 19: CBD Sydney - ventilation fan control installed (Ausgrid drawing 32346)	
NS114:1-0	Sect 19: Basement - CBD Sydney - Water Level Rise Indicator installed at the lowest point of the chamber	

Other Non Compliance Issues

NS114-Other:1-0		
NS114-Other:1-0		
NS114-Other:1-0		
NS114-Other:1-0		
NS114-Other:1-0		
NS114-Other:1-0		
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NS114-Other:1-0		
NS114-Other:1-0		

NS119 Street Lighting Design and Construction	Compliant
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NS119:1-0	Sect 5: Clearance between installed street lighting equipment and exposed conductors is compliant	
NS119:1-0	Sect 5 and NS122: Street lighting assets located clear of personnel access to pole mounted substation and associated equipment	
NS119:1-0	Sect 5: Luminaire not longer required at pillar standard - pillar standard replaced by distribution pillar.	
NS119:1-0	Sect 5: Double insulated street lighting system used.	
NS119:1-0	Sect 5: 2core 16sqmm copper XLPE insulated and PVC sheathed cable used from pillar to standard.	
NS119:1-0	Sect 5: 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.	
NS119:1-0	Sect 5: 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.	
NS119:1-0	Sect 5: SL loads are balanced over 3 phase. Indicate on LV/SL plan the phase to which each luminaire is connected	
NS119:1-0	Sect 5: no street light operating outside of the voltage limits 230Volts +10% and -6%	
NS119:1-0	Sect 5: underground dedicated street light circuit controlled by a fuse. note: fuse not to exceed 32amps.	
NS119:1-0	Sect 5: underground street light cable installed in conduit for whole route.	
NS119:1-0	Sect 5: correct material / equipment used (refer to Annexure C).	
NS119:1-0	Sect 5: Aeroscreen used for the lighting of cul-de-sacs to minimise obtrusive light	
NS119:1-0	Sect 5: excluding special SL designs the SL outreach arm projection at right angles to kerb and toward road centre.	
NS119:1-0	Sect 5: Steel streetlight standards are rag bolt mounted	
NS119:1-0	Sect 5: All street lighting styles comply and are on the approved equipment list.	
NS119:1-0		
NS119:1-0		
NS119:1-0	Private lighting is not part of the design.	
NS119:1-0		
NS119:1-0	Structural Engineer's design submitted for steel standard footing(s) when outreach >3m Note: CPC to forward non standard design to David Stanbury - Development Services - Civil & Structural for approval.	
NS119:1-0		
NS119:1-0		
NS119:1-0		

Other Non Compliance Issues

NS119-Other:1-0		
NS119-Other:1-0		
NS119-Other:1-0		
NS119-Other:1-0		
NS119-Other:1-0		
NS119-Other:1-0		
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NS119-Other:1-0		
NS119-Other:1-0		

NS122 Pole Mounted Substation Construction	Compliant
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NS122:1-0	Substation located on the development or within a dedicated public roadway	
NS122:1-0	Sect 6: Correct substation identification code (master code list)	
NS122:1-0	Sect 7: Located outside of a transmission easement	
NS122:1-0	Sect 7: Not on 132kV, 66kV, 33kV poles.	
NS122:1-0	Sect 7: Located more than 3m from a concrete driveway (dedicated roadway location)	
NS122:1-0	Sect 7: Not in a hazardous location as detailed in NS167 - positioning poles	
NS122:1-0	Sect 7: Not in reclaimed land, land-fill sites, wetlands or similar locations	
NS122:1-0	Sect 7: Located more than 40m from a waterway (unless detailed and approved in an EIA)	
NS122:1-0	Sect 7: Located more than 5m from a drain	
NS122:1-0	Sect 7: Located more than 1m above an area of high ground water	
NS122:1-0	Sect 7: Located on a downhill slope with less than 10% grade	
NS122:1-0	Sect 7: Located outside an area subject to flooding, drainage path, or stormwater ponding area	
NS122:1-0	Sect 7: Provision for wet weather access to substation site for heavy vehicles (off street location)	
NS122:1-0	Sect 7: Located within a 15m wide easement (off street location)	
NS122:1-0	Sect 7: Substation site is clear of trees and vegetation	
NS122:1-0	Sect 7: Substation location is not in the vicinity of potentially hazardous situations such as petrol stations, flammable gas or liquid storage tanks etc.	
NS122:1-0	Sect 10: Stay wire attachment 600mm above HV DOLF	
NS122:1-0	Sect 10: Stay wire has more than 350mm clearance from HV equipment	
NS122:1-0	Sect 10: Correct pole size & strength for selected substation type and the new pole is composite fibre cement.	
NS122:1-0	Sect 10: Substation orientation allows for correct Network phasing (substation symbol shown with correct orientation at pole symbol).	
NS122:1-0	Sect 10: existing bare LV span(s) at proposed substation converted to ABC span(s).	
NS122:1-0	Sect 10: 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).	
NS122:1-0	Sect 12: Requirements of Site Specific Earthing Report detailed on design	
NS122:1-0	3ph substation pole not 12.5m when footing depth greater than 1.85m.	
NS122:1-0	Street lighting assets located clear of personnel access to the pole mounted substation and associated equipment	
NS122:1-0		

Other Non Compliance Issues

NS122-Other:1-0		
NS122-Other:1-0		
NS122-Other:1-0		
NS122-Other:1-0		
NS122-Other:1-0		
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NS122-Other:1-0		

NS141 Site Selection & Preparation - Kiosk Substation	Compliant
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NS141:1-0	Sect 7: Kiosk substation located on the development property	
NS141:1-0	Sect 7: Kiosk site outside an area prone to stormwater run-off	
NS141:1-0	Sect 7: Kiosk above a declared 1 in 100 year flood level	
NS141:1-0	Sect 7: Kiosk location is not in ocean front location or area	
NS141:1-0	Sect 7: Kiosk location is not on contaminated or landfill site	
NS141:1-0	Sect 7: Kiosk location not installed within a building, on building roof, a chamber or in covered areas	
NS141:1-0	Sect 7: Site not to be located under high voltage or subtransmission overhead mains	
NS141:1-0	Sect 7: Top of kiosk base less than 2m above or below the access roadway level or the street footpath level adjacent to kiosk site	
NS141:1-0	Sect 7: Kiosk location is not in the vicinity of potentially hazardous situations such as petrol stations, flammable gas or liquid storage tanks.	
NS141:1-0	Sect 7: Kiosk sited more then 10m away from Fire Hydrant Installation	
NS141:1-0	Sect 7: Kiosk not sited on a corner allotment or other locations adjoining residential backyards of a URD subdivision	
NS141:1-0	Sect 7: 10m radius substation site plan shown on design with details of existing/proposed structures	
NS141:1-0	Sect 7: Retaining wall is outside of the standard substation site area	
NS141:1-0	Sect 7: 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.	
NS141:1-0	Sect 7: Vehicle protection provided for substation site if required (eg bollards in car parks, adjacent to driveways, etc) and should be outside of the standard substation site area	
NS141:1-0	Sect 7: Kiosk site is clear of other services (eg gas, sewer, water, telecommunication, other third party property rights, etc)	
NS141:1-0	Sect 7: The substation site with reduced dimensions not used in a commercial area/development	
NS141:1-0	Sect 7: Substation site to be finished within blue metal, lawn grass, pine bark woodchips or pavers only	
NS141:1-0	Sect 8: minimum 4.5m wide ROW provided to substation site - providing 24hour, all weather, heavy vehicle access. Allowance to be made for vehicle turning.	
NS141:1-0	Sect 8: 24 hour safe pedestrian access for Ausgrid staff direct from public roadway to substation site.	
NS141:1-0	Sect 10: Substation separated from building ventilation by not less than 6m	
NS141:1-0	Sect 10: Pathways and fire escapes do not encroach on substation site	
NS141:1-0	Sect 10: Structures within 3000mm of kiosk housing have a 120/120/120 FRL, unless a suitable blast proof barrier is installed.	
NS141:1-0	Sect 10: Window(s) located a minimum of 3m from kiosk housing	
NS141:1-0	Sect 11: Kiosk site avoid high risk earthing situations eg Telstra pits, swimming pools, metallic fences unless accompanied by a compliant Site Specific Earthing Report.	
NS141:1-0	No more than 2 kiosk substations on one site unless required for voltage drop reasons	

Other Non Compliance Issues

NS141-Other:1-0		
NS141-Other:1-0		
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NS141-Other:1-0		
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NS195 High Voltage Customer Connections (HVCs)**Compliant**

NS195:1-0	HVC Substation located on the development property	
NS195:1-0	Sect 8: Metering installation/MSB must not be located in HVC substation (must be located in customers own enclosure)	
NS195:1-0	Sect 8: Multiple HV supplies (where approved) are located in separate accommodation	
NS195:1-0	Sect 8: 240Vac 20A single phase circuit provided from the customer's main low voltage switchboard	
NS195:1-0	Sect 8: Provision has been made for an approved Ausgrid means of control and isolation between the Customer's Installation and the Ausgrid network (e.g. CB, RMICB, recloser)	
NS195:1-0	Sect 8: A HVC may only provide one point of supply	
NS195:1-0	Accommodation is appropriate for HVC chamber, kiosk or pole mounted	

Other Non Compliance Issues

NS195-Other:1-0		
NS195-Other:1-0		
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NS195-Other:1-0		

Network Standards related to Overhead Construction**Compliant****NS 109 - Design Standards for Overhead Developments**

NS109:1-0	Sect 7: 75°C maximum design temperature for 11kV mains	
NS109:1-0	Sect 7: 75°C maximum design temperature for LV open mains	
NS109:1-0	Sect 7: 80°C maximum design temperature for LV ABC mains	
NS109:1-0	Sect 10: Maximum LV distributor length not exceeded (fault loop limitation)	
NS109:1-0	Sect 12: Maximum load on any distributor does not exceed 75% of distributor's nominal rating	
NS109:1-0	Sect 12: Low voltage distributor(s) maximum voltage drop does not exceed 9Volts.	
NS109:1-0	Sect 12: LV links installed on each LV distributor that is capable of network paralleling (incl. future paralleling) on the first pole on either side of the substation pole.	
NS109:1-0	Sect 12: Last pole on any radial low voltage distributor earthed.	
NS109:1-0	Sect 12: Low voltage road crossing pole(s) (ie lead-in pole) not used	
NS109:1-0	Required network connection voltage provided to proposed allotments within subdivision Note: Lot size determines connection voltage	

NS 122 - Pole Mounted Substation

NS122:1-0	Sect 11: Cattle barrier installed on stay wire at locations where livestock may be present	
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NS 125 - Specification for LV Overhead Conductors

NS125:1-0	Minimum size of LV mains as per design information	
NS125:1-0	Sect 7: LV mains ground clearances obtained	
NS125:1-0	Sect 7: LV mains clearances from structures obtained	
NS125:1-0	Sect 7: LV mains vegetation clearances obtained	
NS125:1-0	Append B: Deviation angle within limits detailed for proposed LV construction(s)	
NS125:1-0	Append B: Correct LV constructions nominated at pole(s)	

NS 126 - Specification for HV Overhead Conductors

NS126:1-0	Minimum size of HV mains as per design information	
NS126:1-0	Separation between 11kV & LV without live line techniques is greater than 1200mm at pole	
NS126:1-0	Separation between 11kV & LV with live line techniques is greater than 2500mm at pole	
NS126:1-0	11kV OHUG transition point not on a concrete pole	
NS126:1-0	Deviation angle within limits detailed for proposed HV components or construction	
NS126:1-0	Minimum mid span separation between 11kV & LV obtained	
NS126:1-0	Minimum separation between 11kV phases obtained at pole & mid span	
NS126:1-0	Sect 6: Surge Arrestors installed at 11kV CCT-Bare transition points	
NS126:1-0	Sect 6: if CCT-Bare transition point is an ABS. Surge arrestors installed one CCT span beyond an ABS	
NS126:1-0	Sect 6: Design details CCT surge arrester earthing as per NS116	
NS126:1-0	Sect 6: Correct CCT constructions nominated at pole(s)	
NS126:1-0	Sect 7: Correct bare mains 11kV constructions nominated at pole(s)	
NS126:1-0	Sect 8: Correct SWER constructions nominated at pole(s)	
NS126:1-0	Sect 9: Provide proof that software uses Ausgrid design parameters	

NS 220 - Overhead Design Manual

NS220:1-0	Sect 6: Individual span lengths are more than half or less then double the ruling span (equivalent span)	
NS220:1-0	Sect 8: Nominated ruling span value is correct for each strain point section	
NS220:1-0	Sect 8: Proposed conductor %UTS does not exceed allowable value for selected conductor	
NS220:1-0	Sect 11: Is %UTS above 18% if so are Vibration Dampers installed	
NS220:1-0	Sect 11: Is %UTS above 20% if so are Armour Rods installed along with vibration dampers	
NS220:1-0	LV design clearance over a RMS Heavy Vehicle Routes is 6.7m or greater	
NS220:1-0	Sect 13: LV design clearance over a carriageway is 6.0m or greater	
NS220:1-0	Sect 13: LV design clearance over ground other than a carriageway is 6.0m or greater	
NS220:1-0	Sect 13: LV design clearance over lands that can not be traversed by vehicle, mobile plant or machinery is 5.0 metres or greater	
NS220:1-0	Sect 13: LV design clearance from structures obtained	
NS220:1-0	Sect 13: 11kV design clearance over a carriageway is 7.5m or greater	
NS220:1-0	Sect 13: 11kV design clearance over ground other than a carriageway is 6.0m or greater	
NS220:1-0	Sect 13: 11kV design clearance over lands that can not be traversed by vehicle, mobile plant or machinery is 5.0m or greater	
NS220:1-0	Sect 13: 11kV design clearance from structures obtained	
NS220:1-0	Sect 13: 11kV mains vegetation clearances obtained	
NS220:1-0	Sect 10: No ground stay in public roadway, pedestrian frequented area (eg parks, reserves, etc)	

NS 167, Positioning of Poles and Lighting Columns

NS167:1-0	Poles are not to be located on railway property	
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Network Standards related to Overhead Construction		Compliant
NS167:1-0	Minimum 300mm clearance is required around all poles for inspection and maintenance, including clearance to property boundaries.	
NS167:1-0	RMS clear zone requirements met	
NS167:1-0	Line poles: Where construction permits (e.g. ABC, CCT) , the alignment closer to property line as shown in the Street Opening Conference shall be used. Where this is not possible, pole to be positioned no less than 0.5m from face of kerb	
NS167:1-0	Lighting poles and replacement lead in poles shall be positioned as indicated in the Street Opening Conference	
NS167:1-0	Poles to be positioned so to avoid encroachment of overhead mains into private property	
NS167:1-0	No more than 3 side arm construction poles are to be used consecutively	
NS167:1-0	Hazardous locations are to be avoided (e.g. impeding vision of motorists, outside of curves, curves at crests, narrowing or narrow roadways, roundabouts)	
NS167:1-0	Avoid positioning poles within 1.5m of driveways and private access ways	
NS167:1-0	New lead in poles are not permitted	
NS167:1-0	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.	
NS167:1-0	Poles are not to be installed through awnings.	
NS167:1-0	If rail crossing required, Master Access Deed requirements met	
NS167:1-0	Cattle barrier installed on stay wire at locations where livestock may be present	
NS167:1-0		

NS 143, Easements, Leases and Rights of Way

NS143:1-0	Proposed property rights accommodate conductor blowout (submit calculation when spans are >100m)	
NS143:1-0		
NS143:1-0		

NS 232, NBN Assets on Ausgrid Poles

NS232:1-0	Specifies acceptable positioning for NBN Co equipment on the Ausgrid overhead network.	
NS232:1-0	For the overhead distribution network only (that is, low voltage and 11/22kV)	
NS232:1-0	Sect 5.1.1 - Structure loading where NBN assets to be attached to be checked against original design standard.	
NS232:1-0	Sect 5.1.1 - Remedial work for overloaded or overstressed structures to be undertaken to Ausgrid Standards and AS/NZS 7000:2016.	
NS232:1-0	Sect 5.1.1 - All designs to include before and after (attachment of NBN equipment) assessment of structure loading.	
NS232:1-0	Sect 5.1.1 - 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.	
NS232:1-0	Sect 5.1.3 - Ground clearance determined with NBN cable at maximum operating temperature which shall be at least 50deg.C.	
NS232:1-0	Sect 5.1.3 - Circuit-to-circuit (Mid-span) clearance shall be calculated with NBN cable at 15deg.C and the Ausgrid conductor at maximum design temperature.	
NS232:1-0	Sect 5.2 - Ground clearances for NBN cables with different land uses in accordance with Table 1.	
NS232:1-0	Sect 5.3 - Clearances from electricity network infrastructure in accordance with Table 2.	
NS232:1-0	Sect 5.4.1 - Attachment points follow the hierarchy shown.	
NS232:1-0	Sect 5.4.2 - Where the preferred and alternative attachment points cannot be used, approval for an exemption is sought.	
NS232:1-0	Sect 5.4.5 - Where an existing network is being extended, the correct attachment points are being used.	
NS232:1-0	Sect 5.4.6 - Improved access is considered during pole replacements.	
NS232:1-0	Sect 5.4.7 - Attachments meet the special conditions for transformer poles.	
NS232:1-0	Sect 5.5.1 - Methods of attachment for wood poles are met.	
NS232:1-0	Sect 5.5.2 - Methods of attachment for poles other than wood poles are met.	
NS232:1-0	Sect 5.5.3 - NBN cables use same pole face as any existing cables.	
NS232:1-0	Sect 5.5.3 - NBN cables will be installed on road-side of a pole where no existing assets on side of pole.	
NS232:1-0	Sect 5.6.1 - Attachment of NBN equipment does not obstruct pole signage or labelling.	
NS232:1-0	Sect 5.6.2 - Attachment of NBN equipment does not allow or assist unauthorised climbing.	
NS232:1-0	Sect 5.6.3 - NBN services meet the attachment requirements.	
NS232:1-0	Sect 5.6.4 - NBN risers meet the attachment requirements.	
NS232:1-0	Sect 5.6.4 - NBN Multipoints not to obstruct future location of street light brackets.	
NS232:1-0	Sect 5.7.2 - Powered ancillary equipment is in the correct position.	
NS232:1-0	Sect 5.7.3 - Unpowered ancillary equipment is in the correct position.	
NS232:1-0	Sect 5.8 - The method of earthing or bonding the neutrals of conductive cables is appropriate.	
NS232:1-0	Sect 5.9 - Overlashed cables meet the diameter requirements.	
NS232:1-0	Sect 5.10.1 - NBN has supplied designs for make-ready work where required.	
NS232:1-0	Sect 5.10.2 - NBN has requested removal of street lighting conductors and replacement of lanterns with photoelectric cell control.	
NS232:1-0	Sect 5.10.3 - Location and safety of aerial service connections considered in NBN attachment locations.	

Network Standards related to Overhead Construction		Compliant
NS232:1-0	Sect 5.12.1 - Designs meet requirements for pole mounted transformers and switchgear.	
NS232:1-0	Sect 5.12.2 - Designs meet requirements for Air Break Switches.	
NS232:1-0	Sect 5.12.3 - NBN cables and assets not installed on subtransmission or transmission structures (33kV to 132kV inclusive).	
NS232:1-0	Sect 5.12.4 - NBN cables and assets not installed on street light columns.	
NS232:1-0	Sect 5.12.5 - NBN cables and assets not installed on private poles without owner's permission.	
NS232:1-0	Sect 5.12.6 - NBN cables and assets (other than support for NBN service connections) not installed on Ausgrid lead-in poles.	
NS232:1-0	Sect 5.12.7 - NBN cables use same attachment points at each end of a span.	
NS232:1-0	Sect 5.12.8 - NBN cable splices not installed on Ausgrid overhead network.	
NS232:1-0	Sect 5.12.9 - NBN assets not installed in hazardous locations.	
NS232:1-0	DPU Disclaimer on Design (FTTC) - "Distribution Point Units (DPUs) 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 DPU may be installed up to the same height. In no case can the DPU be mounted within 1500mm of low voltage mains, or 2500mm of high voltage mains. Where two DPUs 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."	
NS232:1-0	NBN Summary Table	
NS232:1-0	Materials are on NBN Approved Materials List	
NS232:1-0		
NS232:1-0		
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NS232:1-0		
NS232:1-0		

Other Non Compliance Issues

OH-Other:1-0		
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Network Standards related to Underground Construction	Compliant
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NS 110 - Design & Construction URD

NS110:1-0	Sect 9: Correct ADMD applied to design	
NS110:1-0	Sect 10: Typical LV arrangement as per Annexure A options	
NS110:1-0	Sect 10: Pillars located adjacent to lot boundaries	
NS110:1-0	Sect 10: LV distributor(s) do not exceed 75% of distributor nominal rating	
NS110:1-0	Sect 10: No more than three 100amp services from a double link pillar	
NS110:1-0	Sect 10: Initially no more than six 100amp services from a 2 way solid pillar (LV1-33)	
NS110:1-0	Sect 10: Initially no more than four 100amp services from a 2 way solid pillar (CMPBL2EA)	
NS110:1-0	Sect 10: Initially no more than four 100amp services from a 3 way solid pillar (LV1-34)	
NS110:1-0	Sect 10: Initially no more than four 100amp services from a 3 way solid pillar (CMPBL3EA)	
NS110:1-0	Sect 10: Proposed private service pillar(s) located on private property	
NS110:1-0	Sect 10: Number of services to be connected to a solid section of a LV distributor does not exceed 15	
NS110:1-0	Sect 10: The first network service pillar on a LV distributor from a substation is a link pillar	
NS110:1-0	Sect 10: The last network service pillar on a LV distributor from a substation is a link pillar that allows paralleling with adjacent distribution centres	
NS110:1-0	Sect 10: 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).	
NS110:1-0	Sect 14: Driveway/access roads that exceed 2500mm in width have conduits for the cable installation	
NS110:1-0	Sect 14: Spare conduit requirements met.	
NS110:1-0	NS167: Lighting columns in URDs are be positioned 400mm from the property alignment	

NS 112 - Design Standards for Industrial/Commercial Developments

NS112:1-0	Sect 7: Commercial / Industrial pillars (NS224) used.	
NS112:1-0	Sect 7: J type kiosk substation not used.	N/A
NS112:1-0	Sect 7: Proposed K type kiosk only supplies a single customer (ie no multiple tenancies).	
NS112:1-0	Sect 7: Direct Distributor - voltage drop calcs provided & results within limits	
NS112:1-0	Sect 7: Direct Distributor - rating does not exceed 800amps	
NS112:1-0	Sect 7: Direct distributor - cable route for 600amp to 800amp does not exceed 30m	
NS112:1-0	Direct Distributor terminates at private termination enclosure/MSB	
NS112:1-0	Direct Distributor private termination enclosure/MSB located within 1m of property boundary (refer to NSW electrical service rules)	
NS112:1-0	Sect 8: LV Network distributor(s) do not exceed 75% of distributor nominal rating.	
NS112:1-0	Sect 8: Voltage drop (in volts not percentage) detailed at extremities of LV distributor(s) on drawing and does not exceed 9 Volts.	
NS112:1-0	Sect 8: HV cable laid in every street of the subdivision and loops in and out of cul-de-sacs.	
NS112:1-0	Sect 8: LV Network distributor cable is direct laid with 2 spare conduits on both sides of the dedicated public roadway.	
NS112:1-0	Sect 8: LV Network distributors loop into and out of pillars (ie no dead end pillars)	
NS112:1-0	Sect 8: Pillars located adjacent to lot boundaries	
NS112:1-0	Pillars located generally on every second boundary both sides of the street	
NS112:1-0	Sect 8: Road crossing consist of 4 conduits	
NS112:1-0	Sect 8: Road crossing intervals not in excess of 75m	
NS112:1-0	Sect 8: Road crossing aligned with nearest pillar	
NS112:1-0	Sect 8: The first service pillar on a LV distributor from a substation is a link pillar	
NS112:1-0	Sect 8: The last service pillar on a LV distributor from a substation is a link pillar that allows	
NS112:1-0	Spare conduit requirements met.	

NS 127 - Specifications for LV Cable Joints & Terminations.

NS127:1-0	Sect 6: Max number of Customer Service UGOHs on pole - Refer to Section 2 of the Service and Installation Rules of NSW	
NS127:1-0	Sect 6: LV Network UGOHs shall not be installed on poles supporting an earth down lead, which is part of a sub-transmission earthing system.	
NS127:1-0	Sect 6: UGOHs on Ausgrid poles are to be placed so that the danger of vehicle impact is minimised.	
NS127:1-0	Sect 6: UGOHs on substation poles must not exceed 70mm2	
NS127:1-0	Sect 6: 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.	
NS127:1-0	Sect 8: 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.	
NS127:1-0	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
NS 129 - 11kV Joints and Terminations - Paper Insulated Lead Covered Cables		
NS129:1-0	Sect 6: Joint hole shall not be a confined space	
NS129:1-0	Sect 8: UGOH shall be on the non traffic side of the pole	
NS129:1-0	Sect 8: Cable shall not be wrapped 180° from one side of the pole to the other. Rotation from one face to another through 90° will only be allowed by approval if no alternative options exist. This may require taller poles to ensure the min bending radius of the cable is not compromised.	
NS129:1-0	Sect 8: If EFI required on the UGOH, it must be in accordance with dwg 31318	
NS129:1-0	Sect 8: If animal proofing of UGOH required it must be in accordance with dwg 160354	
NS129:1-0	Sect 8: No UGOH on concrete or steel sub transmission pole.	

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

NS177:1-0	Sect 10: UGOH shall be on the non traffic side of the pole	
NS177:1-0	Sect 10: No UGOH on concrete or steel sub transmission pole.	
NS177:1-0	Sect 10: Ausgrid approval obtained for alterations to an existing UGOH pole construction	

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

NS130:1-0	Working with asbestos ducts must be in accordance with safe working methods.	
NS130:1-0	Use of existing spare ducts prior approval sought, appropriate design notations.	
NS130:1-0	If rail crossing required, ensure Master Access Deed requirements met	
NS130:1-0	Breaking into and removal of concrete encased duct lines is to be avoided where live cables exist in the ducts.	
NS130:1-0	In pit and duct systems, jointing must be carried out in pits and a relevant pit internal diagram shown with conduit penetrations.	
NS130:1-0	Appropriate conduit size is used.	
NS130:1-0	Substation site is setback from street frontage: all cables on private property installed in conduit.	
NS130:1-0	Concrete encased conduit requirements or reduced cover requirements met if approved.	
NS130:1-0	Joints on adjacent cables to be staggered by least 1m	
NS130:1-0	Any access issues, known obstructions affecting project or features such as rock, sand, etc are avoided	
NS130:1-0	Joint at least 6m from road crossing, street corners, bends, driveways, concrete encased conduits, with a 2m straight section either side. Does not include bends into substations	
NS130:1-0	Cable riser details shown and clamping of cables every 1m	
NS130:1-0	Cable testing specified for "out of service" cables intended to be used	
NS130:1-0	On steep inclines or sand backfill used, water barriers/bulkheads specified	
NS130:1-0	Proposed fibre optic conduit is only within the Ausgrid deemed strategic corridor	
NS130:1-0	Thermal Stable Bedding (TSB) installed where six(6) or more power conduits installed.	

NS 172 - Design Requirements for Cable Jointing Pits and Vaults

NS172:1-0	Sect 5: Pits/vaults must be constructed of concrete block work, reinforced concrete or brickwork, appropriate to the location of the pit within the street and geographically within the city.	
NS172:1-0	Sect 5: Brickwork pits only in areas of rock and where area around the pit is backfilled with a sand/cement mix.	
NS172:1-0	Sect 5: In areas with acid sulphate soils or in tidal areas, only wholly reinforced concrete pits shall be used. 50MPa concrete utilising Sulphate Resisting (SR) cement shall be specified.	
NS172:1-0	Sect 5: Evidence of designer being trained in OHS Regulation 2001, Section 77 must be provided	
NS172:1-0	Sect 5: Structural drawings of proposed pit are to be certified by a structural engineer. Structural certification must also cover (as applicable) - Any walls with pulling eyes or eye bolts must be designed to resist 50 kN point load. - Design service life of 100 years with evidence of compliance to AS5100 (Pit) & AS3600 (Cover) - Pit and any temporary road cover for use during construction shall be designed to carry road loads as required by the RTA for bridge design - consideration of special conditions (e.g buoyancy in high water table, building foundations, mine subsidence, other services in or near)	
NS172:1-0	Sect 5: Structural drawing must include minimum standard items including: ladders, handrails, pulling eyes, std eyebolts, sump, falls, road plate and beam system	
NS172:1-0	Sect 5: Correct access is provided, considering size, geographical location and multi access requirement	
NS172:1-0	Sect 5: Evidence is provided showing that access covers are designed to AS3996	
NS172:1-0	Sect 5: Evidence is provided showing that ladders comply with AS1657, or that fall arrest equipment is specified.	

Network Standards related to Underground Construction		Compliant
NS172:1-0	Sect 5: For fall arrest equipment, evidence is to be provided that wall mounts comply with AS/NZS 1891, WHS and are capable of handling load specified.	
NS172:1-0	Sect 5: Columns are to be avoided.	
NS172:1-0	Sect 5: Pulling eyes are to be installed in suitable locations to cater for incoming cable ducts and access hatches	
NS172:1-0	Sect 5: Water proofing shall be provided if below the water table.	
NS172:1-0	Sect 5: Provision must be made to allow for accommodation of planned number of cables and/or joints, copper pilots or fibre, via appropriately sized brackets.	
NS172:1-0	Sect 5: Minimum size: HV 5m x 4m , LV 2m x 2m unless otherwise specified by Ausgrid. 2m internal height	
NS172:1-0	Sect 5: Corrosion resistant label, confined space label, fall arrest signage, load capacity of pulling eyes label and company name & drawing number label must be provided.	
NS172:1-0	End of duct lines, UGOH poles not to be located within railway property	

NS 224 - Low Voltage UG Distribution Utilising Pillars

NS224:1-0		
NS224:1-0		

Other Non Compliance Issues

UG-Other:1-0		
UG-Other:1-0		
UG-Other:1-0		
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