Sydney Metro City & South West:
Crows Nest
Over Station Development

Services and Utilities Infrastructure Report

Applicable to:	Sydney Metro City & Southwest
Author:	METRON
Owner	Sydney Metro Authority
Status:	Final
Version:	P10
Date of issue:	November 2018

Document No: NWRLSRT-MET-SCN-CE-REP-000003

Revision	Date	Suitability Code
P10	*07/11/18*	*For Stage Approval*

Approval Record

Function	Position	Name	Date
Prepared by	*Graduate Civil Engineer*	*S.YAMAMOTO*	*07/11/18*
Technical Checker	*Senior Civil Engineer*	*R.HARVEY*	*07/11/18*
Reviewed By	*Associate Technical Director*	*P.AUSTIN*	*07/11/18*
Approved by	*Design Manager*	*C.BAKER*	*07/11/18*

Amendment Record

Changes made to this document since its last revision, which affect its scope or sense, are marked in the right margin by a vertical bar (|).

Date	Rev	Amendment Description	By
	P09	*FINAL COMMENT UPDATE*	
	P08	*DRAFT 6 SUBMISSION*	
	P07	*DRAFT 5 SUBMISSION*	
2018/09/27	*P06*	*INTERNAL REVIEW*	

Information Class: Standard	
This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.	We accept no responsibility of the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties. This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

Table of Contents

Terms & Definitions

	Definition
ARI	Average Recurrence Interval – The "average" or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration. It is implicit in this definition that the periods between exceedances are generally random.
ASP3	A qualified level 3 designer acting on behalf of the distributor - Accredited Service Provider
BMS	Means the Building Management Statement prepared by TfNSW and which outlines the mechanism for managing the operational interfaces between the OSD Lot(s) and the Station Lot(s)
BOD	Means the Basis of Design Report undertaken by USDTS Design team to provide summary of basic design criteria and design requirements.
CSSI	An application made for the development of the Sydney Metro under the Critical State Significant Infrastructure provisions of the EP&A Act 1979 (as amended)
DBYD	Dial Before You Dig (DBYD) is a free national referral service designed to assist in identifying, preventing damage and disruption to Australia's vast infrastructure networks.
DRAINS	Stormwater Drainage System design and analysis program.
Integrated OSD Design	Means the design concept prepared by the OSD Design team which integrates a commercially viable OSD with the Metro Station
Metro Station	Means the functional areas necessary for the efficient and effective use and operation of the Sydney metro at the location the subject of this document
OSD	Means the development of air space over each site acquired to enable the Sydney Metro project; also known as Over Station Development where the site is a Station
OSD Developer	Means the entity awarded the rights to commercially develop the OSD Lot(s).
OSD Enabling Works	Means the works to be provided by the STME and TSE Contractors and designed by the USDTS Design Team to fully enable the subsequent development of the OSD
OSD Lot(s)	Means the spaces created by volumetric title that accommodates the functional areas necessary for the efficient and effective use and operation of the OSD. The OSD Lot(s) may be further subdivided to create lots specific to different uses
Pre-Existing	The previously existing site, prior to any demolition or diversion works undertaken for the Sydney Metro Station.
PSD	Permissible Site Discharge of stormwater runoff stipulated by Council.
Reference	The scope of the Project as determined by the NSW Government as a

Design	result of the Project Definition Phase. The Reference Design consists of the Reference Scope and technical requirements prior to the Stage 1 Design phase.
SSD	An application made for the development of the OSD under the State Significant Development provisions of the EP&A Act 1979 (as amended)
Stage 1 Design	The scope of the Project as determined by the NSW Government as a result of the Project Reference Design Phase. The Stage 1 Preliminary 40% Design phase follows on from the Reference Design.
Station Lot(s)	Means the spaces created by volumetric title that accommodates the functional areas necessary for the efficient and effective use and operation of the Metro Station
STME Contract	Means the Stations, Mechanical and Electrical Works undertaken by the STME Contractor
STME Contractor	Means the contractor appointed under the STME Contract
Sydney Metro (Metro)	Means the overall Sydney Metro network
SMDO	Means the Sydney Metro Delivery Office set up by TfNSW
Sydney Metro Northwest	Means the former North West Rail Link, i.e. the project between Cudgegong Road, Rouse Hill and Chatswood (inclusive)
Sydney Metro City & Southwest	Means the proposed metro railway between Chatswood and Bankstown, including the Sydney Metro Harbour Crossing.
Sydney Trains	An organisation formed out of RailCorp from the NSW rail industry reform process. Sydney Trains serves Sydney customers. NSW Trains serves intercity and regional customers.
TfNSW	Means Transport for NSW (a New South Wales government agency constituted under the Transport Administration Act 1988 (NSW)) (ABN 18 804 239 602), the Principal under this Agreement.
Transfer Level	Means the uppermost level to be constructed by the STME Contractor and at which level design responsibility for the performance of the OSD transfers from the OSD Design team to the USDTS Design team
TSE Contractor	Means the contractor appointed to undertake the TSE Works
TSE Works	Means the design and construct contract for the tunnels, station excavations, cross passages and associated civil works components of the Sydney Metro City and Southwest
USDTS	Underground Stations Design and Technical Services
USDTS Design Team	Means the design team appointed to undertake the USDTS services
Works	Means the works to be performed by a major works contractor under a Project Deed.

Executive Summary

This report supports a concept State Significant Development Application (concept SSD Application) submitted to the Department of Planning and Environment (DPE) for the Over Station Development (OSD) above Crows Nest Metro station.

This report specifically provides a Services Infrastructure Assessment that has been undertaken for the OSD concept drawings prepared by Sydney Metro in support of the concept SSD Application and Secretary's Environmental Assessment Requirements (SEARs).

The Crows Nest Station precinct is located between the Pacific Highway and Clarke Street (eastern side of the Pacific Highway) and Oxley Street and south of Hume Street, Crows Nest. The OSD is situated above the Sydney Metro Station and separated in to 3 separate areas, Site A, B and C with a combined hotel, commercial and residential use.

The design of the OSD is an integrated design solution to occur in parallel with the station design. The station designers are to make provisions to for the OSD to be constructed after the station has become operational with no impact on Sydney Metro operations. The physical provisions for utilities connections and infrastructure below the Transfer Level are planned to be undertaken as part of the station works under the CSSI Approval. This strategy is aimed at reducing the potential for future disruption to the Metro Station and surrounding areas should the OSD construction be delayed after the completion of the station.

This assessment includes the infrastructure capacity required to service the retail, residential and the commercial tenancies for the indicative OSD design. Based on preliminary consultation between Sydney Metro and the relevant Utility Services Providers, there is either sufficient capacity in the pre-existing infrastructure or upgrade works can be provided to accommodate the proposed indicative OSD Design. A summary of the relevant Utility Service Providers are listed below:

- Sydney Water Corporation – Sewage and Potable Water
- North Sydney Council – Stormwater
- Jemena – Gas
- Ausgrid – Electrical
- NBN – Telecommunication
- Optus – Telecommunication
- Telstra – Telecommunication

Due to the advanced works of the TSE Contract, information plans obtained for the preparation of this report may be outdated, temporarily relocated, capped or made redundant. It is imperative that the future OSD designer will seek the latest TSE contractor and survey information for inclusion of the OSD design.

1.0 Introduction

1.1 Purpose of this report

This report supports a concept State Significant Development application (concept SSD Application) submitted to the Department of Planning and Environment (DPE) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The concept SSD Application is made under Section 4.22 of the EP&A Act.

Sydney Metro is seeking to secure concept approval for a mixed-use development comprising four buildings above the Crows Nest Station, otherwise known as the over station development (OSD). The concept SSD Application seeks consent for building envelopes and land uses, maximum building heights, maximum gross floor areas, pedestrian and vehicular access, circulation arrangements and associated car parking and the strategies and design parameters for the future detailed design of the development.

Sydney Metro proposes to procure the construction of the OSD as part of an Integrated Station Development package, which would result in the combined delivery of the station, OSD and public domain improvements. The station and public domain elements form part of a separate planning approval for Critical State Significant Infrastructure (CSSI) approved by DPE on 9 January 2017.

As the development is within a rail corridor, is associated with railway infrastructure and is for commercial premises and residential accommodation with a Capital Investment Value of more than $30 million, the project is identified as State Significant Development (SSD) pursuant to Schedule 1, 19(2)(a) of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). The development is therefore, State significant development for the purposes of Section 4.36 of the EP&A Act.

This report has been prepared to specifically respond to the Secretary's Environmental Assessment Requirements (SEARs) issued for the concept SSD Application on 26 September 2018 which states that the Environmental Impact Statement (EIS) is to address the following requirements:

Reference	SEARs Requirement	Where Addressed in Report
SSD9579 – Key Issues	**1. Environmental Planning Instruments (EPIs), Policies and Guidelines** Address the relevant provisions, goals and objectives in the following: Relevant Council policies, codes and guidelines (where required pursuant to relevant Local Environmental Plan)	Section 3.0
SSD9579 – Key Issues	**2. Integration with Sydney Metro Station infrastructure**	Section 1.0, 2.0, 5.0

	• identify the extent of the proposal that is State Significant Development (SSD) and how this relates to the approved Critical State Significant Infrastructure applications and any modifications • identify any specific requirements of the CSSI approval that has influenced the design	
SSD9579 – Key Issues	**13. Utilities** The EIS shall: identify the existing capacity of the site to service the development proposed and any augmentation requirements for utilities, including arrangements for electrical network requirements, drinking water, waste water and recycled water	Section 5.0
SSD9579 - Consultation	During the preparation of the EIS, you must consult with relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular, you must consult with: • North Sydney Council • Relevant special interest groups.	Section 3.0
SSD9579 - References	The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. While not exhaustive, the following attachment contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this proposal.	Section 4.0
SSD9579 – Plans and documents	The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedules 1 and 2 of the Environmental Planning and Assessment Regulation 2000. Provide these as part of the EIS rather than as separate documents. In addition, the EIS must include the following: • services and utilities impact assessment	Appendix H

1.2 Overview of the Sydney Metro in its context

Sydney Metro is Australia's biggest public transport project. A new standalone metro railway system, this 21st century network will deliver 31 metro stations and 66km of new metro rail for Australia's biggest city — revolutionising the way Sydney travels. Services start in the first half of 2019 on Australia's first fully-automated railway.

Sydney Metro was identified in *Sydney's Rail Future*, as an integral component of the *NSW Long Term Transport Master Plan*, a plan to transform and modernise Sydney's rail network so it can grow with the city's population and meet the future needs of customers. In early 2018, *the Future Transport Strategy 2056* was released as an update to *the NSW Long Term Transport Master Plan* and *Sydney's Rail Future*. Sydney Metro City & Southwest is identified as a committed initiative in the *Future Transport Strategy 2056*.

Sydney Metro is comprised of three projects, as illustrated in Figure 1:

- **Sydney Metro Northwest** — formerly the 36km North West Rail Link. This $8.3 billion project is now under construction and will open in the first half of 2019 with a metro train every four minutes in the peak.

- **Sydney Metro City & Southwest** — a new 30km metro line extending the new metro network from the end of Sydney Metro Northwest at Chatswood, under Sydney Harbour, through the CBD and south west to Bankstown. It is due to open in 2024 with an ultimate capacity to run a metro train every two minutes each way through the centre of Sydney.

- **Sydney Metro West** – a new underground railway connecting the Parramatta and Sydney central business districts. This once-in-a-century infrastructure investment will double the rail capacity of the Parramatta to Sydney CBD corridor and will establish future capacity for Sydney's fast growing west. Sydney Metro West will serve five key precincts at Westmead, Parramatta, Sydney Olympic Park, The Bays and the Sydney CBD. The project will also provide an interchange with the T1 Northern Line to allow faster connections for customers from the Central Coast and Sydney's north to Parramatta and the Sydney CBD.

Sydney's new metro, together with signalling and infrastructure upgrades across the existing Sydney suburban rail network, will increase the capacity of train services entering the Sydney CBD – from about 120 an hour currently to up to 200 services beyond 2024. That's an increase of up to 60 per cent capacity across the network to meet demand.

Sydney Metro City & Southwest includes the construction and operation of a new metro rail line from Chatswood, under Sydney Harbour through Sydney's CBD to Sydenham and on to Bankstown through the conversion of the existing line to metro standards.

The project also involves the delivery of six (6) new metro stations, including at Crows Nest, together with new underground platforms at Central. Once completed, Sydney Metro will have the ultimate capacity for a train every two minutes through the CBD in each direction - a level of service never seen before in Sydney.

Figure 1: Sydney Metro alignment map

On 9 January 2017, the Minister for Planning (the Minister) approved the Sydney Metro City & Southwest - Chatswood to Sydenham application lodged by TfNSW as a Critical State Significant Infrastructure project (reference SSI 15_7400), hereafter referred to as the CSSI Approval.

The CSSI Approval includes all physical work required to construct the CSSI, including the demolition of existing buildings and structures on each site. Importantly, the CSSI Approval also includes provision for the construction of below and above ground structures and other components of the future OSD (including building infrastructure and space for future lift cores, plant rooms, access, parking and building services, as relevant to each site). The rationale for this delivery approach, as identified within the CSSI application is to enable the OSD to be more efficiently built and appropriately integrated into the metro station structure.

The EIS for the Chatswood to Sydenham alignment of the City & Southwest project identified that the OSD would be subject to a separate assessment process.

Since the CSSI Approval was issued, Sydney Metro has lodged five modification applications to amend the CSSI Approval as outlined below:

- **Modification 1** - Victoria Cross and Artarmon Substation which involves the relocation of the Victoria Cross northern services building from 194-196A Miller Street to 50 McLaren Street together with the inclusion of a new station entrance at this location referred to as Victoria Cross North. The modification also involves the relocation of the substation at Artarmon from Butchers Lane to 98 – 104 Reserve Road. This modification application was approved on 18 October 2017.

- **Modification 2 -** Central Walk which involves additional works at Central Railway Station including construction of a new eastern concourse, a new eastern entry, and upgrades to suburban platforms. This modification application was approved on 21 December 2017.

- **Modification 3** - Martin Place Station which involves changes to the Sydney Metro Martin Place Station to align with the Unsolicited Proposal by Macquarie Group Limited (Macquarie) for the development of the station precinct. The proposed modification involves a larger reconfigured station layout, provision of a new unpaid concourse link and retention of the existing MLC pedestrian link and works to connect into the Sydney Metro Martin Place Station. It is noted that if the Macquarie proposal does not proceed, the original station design remains approved. This modification application was approved on 22 March 2018.

- **Modification 4** - Sydenham Station and Sydney Metro Trains Facility South which incorporated Sydenham Station and precinct works, the Sydney Metro Trains Facility South, works to Sydney Water's Sydenham Pit and Drainage Pumping Station and ancillary infrastructure and track and signalling works into the approved project. This modification application was approved on 13 December 2017.

- **Modification 5** - Blues Point acoustic shed modification which involves the installation of a temporary acoustic shed at Blues Point construction site and retrieval of all parts of the tunnel boring machines driven from the Chatswood dive site and Barangaroo through the shaft at the Blues Point temporary site. This modification application was approved on 2 November 2018.

The CSSI Approval as modified allows for all works to deliver Sydney Metro between Chatswood and Sydenham Stations and also includes upgrade of Sydenham Station.

The remainder of the City & Southwest alignment (Sydenham to Bankstown) proposes the conversion of the existing heavy rail line from west of Sydenham Station to Bankstown to metro standards. This part of the project, referred to as the Sydenham to Bankstown upgrade, is the subject of a separate CSSI Application (Application No. SSI 17_8256) for which an EIS was exhibited between September and November 2017, and a Submissions and Preferred Infrastructure Report was exhibited in June and July 2018. This application is currently being assessed by DPE.

1.3 Planning relationship between Crows Nest Station and the OSD

While Crows Nest Station and the OSD will form an Integrated Station Development, the planning pathways defined under the *Environmental Planning & Assessment Act 1979* require separate approval for each component of the development. In this regard, the approved station works (CSSI Approval) are subject to the provisions of Part 5.1 of the EP&A Act (now referred to as Division 5.2) and the OSD component is subject to the provisions of Part 4 of the EP&A Act.

For clarity, the approved station works under the CSSI Approval included the construction of below and above ground structures necessary for delivering the station and also enabling construction of the integrated OSD. This includes but is not limited to:

- demolition of existing development
- excavation
- integrated station and OSD structure (including concourse and platforms)
- lobbies
- retail spaces within the station building
- public domain improvements
- pedestrian through-site link
- access arrangements including vertical transport such as escalators and lifts
- space provisioning and service elements necessary to enable the future development of the OSD, such as lift cores, plant rooms, access, parking, retail, utilities connections and building services.

The vertical extent of the approved station works above ground level is defined by the 'transfer level' level, above which would sit the OSD. This delineation is illustrated in Figure 2.

The CSSI Approval also establishes the general concept for the ground plane of Crows Nest Station including access strategies for commuters, pedestrians, workers, visitors and residents.

Since the issue of the CSSI Approval, Sydney Metro has undertaken sufficient design work to determine the space planning and general layout for the station and identification of those spaces within the station area that would be available for the OSD. In addition, design work has been undertaken to determine the technical requirements for the structural integration of the OSD with the station. This level of design work has informed the concept proposal for the Crows Nest OSD. It is noted that ongoing design development of the works to be delivered under the CSSI Approval would continue with a view to developing an Interchange Access Plan (IAP) and Station Design Precinct Plan (SDPP) for Crows Nest Station to satisfy Conditions E92 and E101 of the CSSI Approval.

All public domain improvement works around the site would be delivered as part of the CSSI Approval.

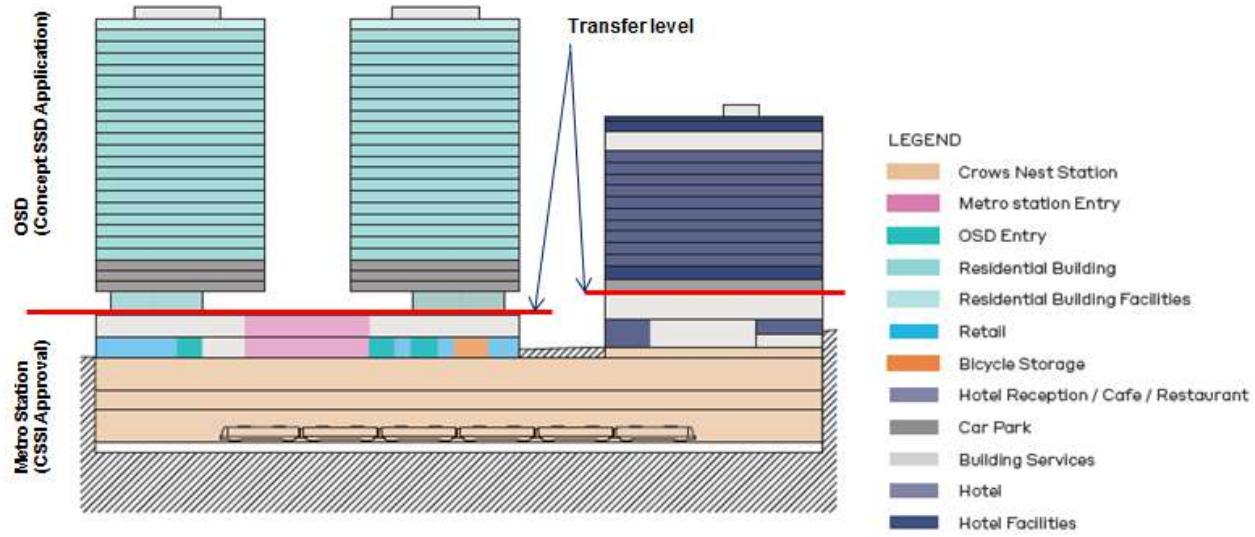


Figure 2: Delineation between the Metro station and OSD (based on indicative OSD design)

1.4 The Strategic Planning Context

DPE is currently undertaking strategic planning investigations into revitalising the area surrounding St Leonards railway station and the metro station at Crows Nest. In August 2017, DPE released the *St Leonards and Crows Nest Station Precinct Interim Statement* and in October 2018 DPE released the *St Leonards and Crows Nest 2036 Draft Plan* (2036 Draft Plan) and supporting documents which detail recommended changes to land use controls in the precinct. These documents recommend new developments be centred around the Pacific Highway corridor and the Crows Nest Station while protecting the amenity of Willoughby Road.

In October 2018, DPE also placed on public exhibition the *Crows Nest Sydney Metro Site Rezoning Proposal* (Planning Proposal). The Planning Proposal outlines the State led rezoning of the subject site, on the basis that the current planning controls in the *North Sydney Local Environmental Plan 2013* do not reflect the opportunities for improved accessibility associated with the new metro station enabling people to live, work and spend time close to public transport. This concept SSD Application is aligned with the planning controls proposed in the Planning Proposal.

1.5 The Site

Crows Nest Station precinct is located between the Pacific Highway and Clarke Street (eastern side of the Pacific Highway) and Oxley Street and south of Hume Street, Crows Nest (Figure 3).

The site is located within the North Sydney Local Government Area.

The Crows Nest Station precinct is divided into three separate sites as illustrated in Figure 4 and described below:

- **Site A:** Six lots in the block bound by the Pacific Highway, Hume Street, Oxley Street and Clarke Lane (497-521 Pacific Highway, Crows Nest)
- **Site B:** Three lots on the southern corner of Hume Street and Pacific Highway (477-495 Pacific Highway, Crows Nest)
- **Site C:** One lot on the north-western corner of Hume Street and Clarke Street (14 Clarke Street, Crows Nest).

Sites A, B and C have a combined site area of 6,356 square metres.

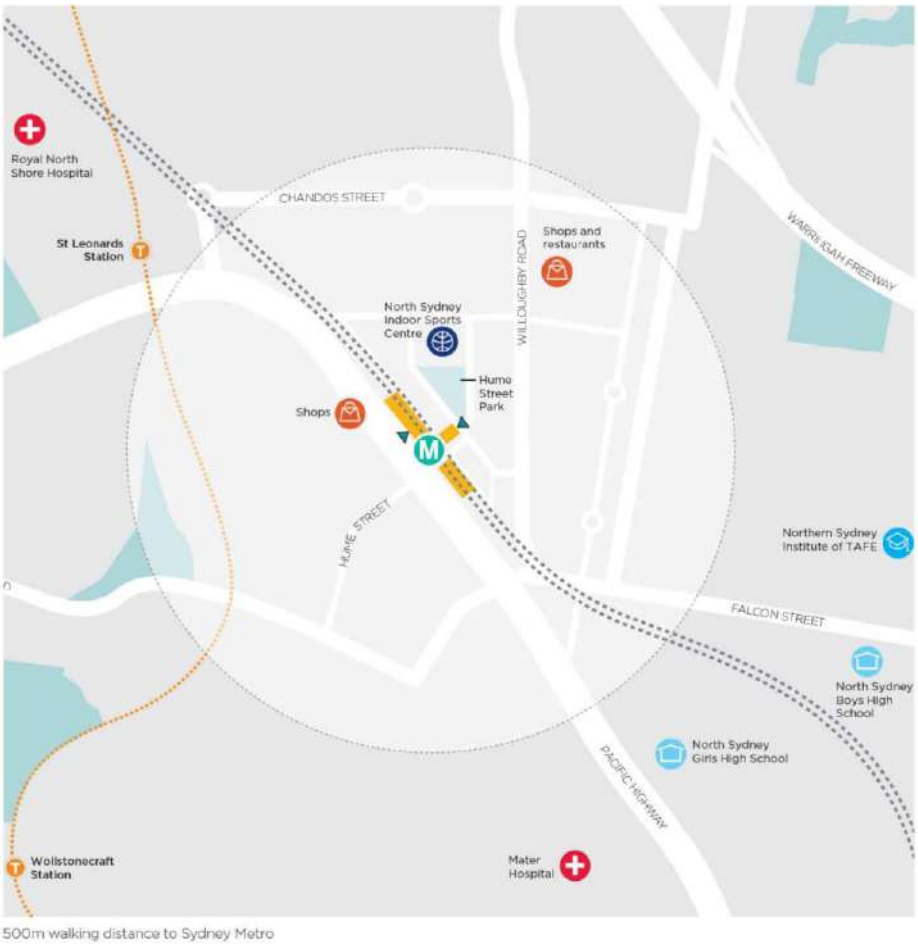


Figure 3: Crows Nest Station location plan

Figure 4: The subject site

The site comprises the following properties:

- **Site A:**
  - 497 Pacific Highway (Lot 2 in DP 575046)
  - 501 Pacific Highway (Lot 1 in DP 575046)
  - 503-505 Pacific Highway (Lot 3 in DP 655677)
  - 507-509 Pacific Highway (Lot 4 in DP 1096359)
  - 511-519 Pacific Highway (SP 71539)
  - 521-543 Pacific Highway (Lot A and Lot B in DP 374468)
- **Site B:**
  - 477 Pacific Highway (Lot 100 in DP 747672)
  - 479 Pacific Highway (Lot 101 in DP 747672)
  - 491-495 Pacific Highway (Lot 100 in DP 442804)
- **Site C:**
  - 14 Clarke Street (Lot 1 in SP 52547)

1.6 Overview of the Proposed Development

This concept SSD Application comprises the first stage in the Crows Nest OSD project. It will be followed by a detailed SSD Application for the design and construction of the OSD to be lodged by the successful contractor who is awarded the contract to deliver the Integrated Station Development.

This concept SSD Application seeks approval for the planning and development framework and strategies to inform the future detailed design of the Crows Nest OSD.

The concept SSD Application specifically seeks approval for the following:

- maximum building envelopes for Sites A, B and C, including street wall heights and setbacks as illustrated in the plans prepared by Foster + Partners for Sydney Metro
- maximum building heights:
    - **Site A:** RL 183 metres or equivalent of 27 storeys (includes two station levels and conceptual OSD space in the podium approved under the CSSI Approval)
    - **Site B:** RL 155 metres or equivalent of 17 storeys (includes two station levels and conceptual OSD space approved under the CSSI Approval)
    - **Site C:** RL 127 metres or 8 storeys (includes two station levels and conceptual OSD space approved under the CSSI Approval)

      Note 1: the maximum building heights defined above are measured to the top of the roof slab and exclude building parapets which will be resolved as part of future detailed SSD Application(s)
    - maximum height for a building services zone on top of each building to accommodate lift overruns, rooftop plant and services:
        - **Site A:** RL 188 or 5 metres
        - **Site B:** RL 158 or 3 metres
        - **Site C**: RL 132 or 5 metres

      Note 1: the use of the space within the building services zone is restricted to non-habitable floor space.

      Note 2: for the purposes of the concept SSD Application, the maximum height of the building envelope does not make provision for the following items, which will be resolved as part of the future detailed SSD Application(s):
        - communication devices, antennae, satellite dishes, masts, flagpoles, chimneys, flues and the like, which are excluded from the calculation of building height pursuant to the standard definition in NSLEP 2013
        - architectural roof features, which are subject to compliance with the provisions in Clause 5.6 of NSLEP 2013, and may exceed the maximum building height, subject to development consent.
- maximum gross floor area (GFA) of 55,400sqm for the OSD comprising the following based on the proposed land uses:
    - **Site A:** Residential accommodation - maximum 37,500 square metres (approximately 350 apartments)
    - **Site B:** Hotel / tourist accommodation and associated conference facilities or commercial office premises GFA - maximum of 15,200 square metres (approximately 250 hotel rooms)
    - **Site C:** Commercial office premises GFA - maximum of 2,700 square metres
    - **Site A or C**: social infrastructure GFA inclusive of the GFA figures nominated above for each site, with provision optional as follows:
        - Site A: podium rooftop (approximately 2,700 square metres)

- Site C: three floors and rooftop (approximately 1,400 square metres)

Note 1: GFA figures exclude GFA attributed to the station and station retail space approved under the CSSI Approval

- a minimum non-residential floor space ratio (FSR) for the OSD across combined Sites A, B and C of 2.81:1 or the equivalent of 17,900 square metres
- the use of approximate conceptual areas associated with the OSD which have been provisioned for in the Crows Nest station box (CSSI Approval) including areas above ground level (i.e. OSD lobbies and associated spaces)
- a maximum of 150 car parking spaces on Sites A and B associated with the proposed commercial, hotel and residential uses
- loading, vehicular and pedestrian access arrangements
- strategies for utilities and services provision
- strategies for managing stormwater and drainage
- a strategy for the achievement of ecological sustainable development
- a public art strategy
- indicative signage zones
- a design excellence framework
- the future subdivision of parts of the OSD footprint, if required.

As this is a staged development pursuant to section 4.22 of the EP&A Act, future approval would be sought for the detailed design and construction of the OSD.

The proposed location of the buildings on the site is illustrated in the location plan provided at Figure 5.

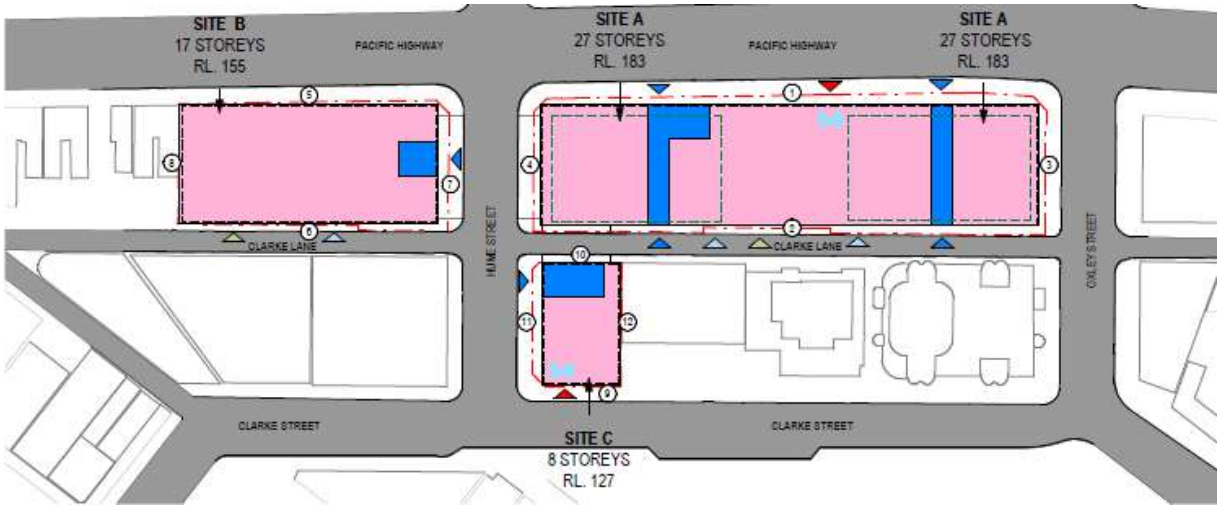


Figure 5 Proposed location of buildings

The total GFA for the integrated station development, including the station GFA (i.e. retail, station circulation and associated facilities) and the OSD GFA is 60,400 square metres, equivalent to a floor space ratio (FSR) of 9.5.1.

The concept proposal includes opportunities for community uses in the development on either Site A or Site C. This space has the potential to be used for a range of uses including community facilities, child care centre, recreational area/s, library, co-working space, which can take advantage of the sites accessibility above the metro station.

Through design development post the CSSI Approval, pedestrian access to the metro station is proposed from the Pacific Highway and from Clarke Street, opposite the Hume Street Park. Vehicular access to the site including separate access to the loading docks and parking is proposed from Clarke Lane.

Public domain works around the site would be delivered as part of the CSSI Approval. Notwithstanding, the OSD will be appropriately designed to complement the station and activate the public domain. Provision for retail tenancies to activate the public domain are included in the ground floor of Sites A, B and C, as part of the CSSI Approval. Future detailed development applications will seek approval for the fitout and specific use of this retail space.

Drawings illustrating the proposed building envelopes are provided in Figures 6A and 6B. The concept SSD Application includes an indicative design for the OSD to demonstrate one potential design solution within the proposed building envelope (refer to Figure 7).

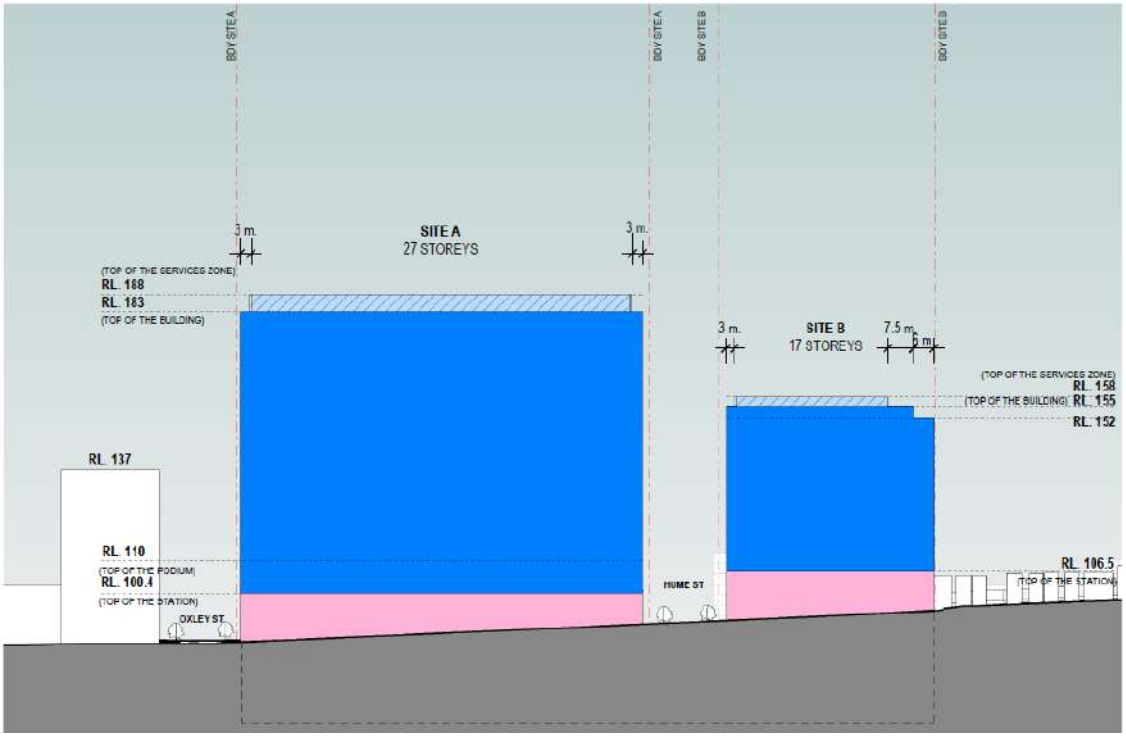


Figure 6A: Proposed Crows Nest OSD building envelopes – west elevation (Pacific Highway)

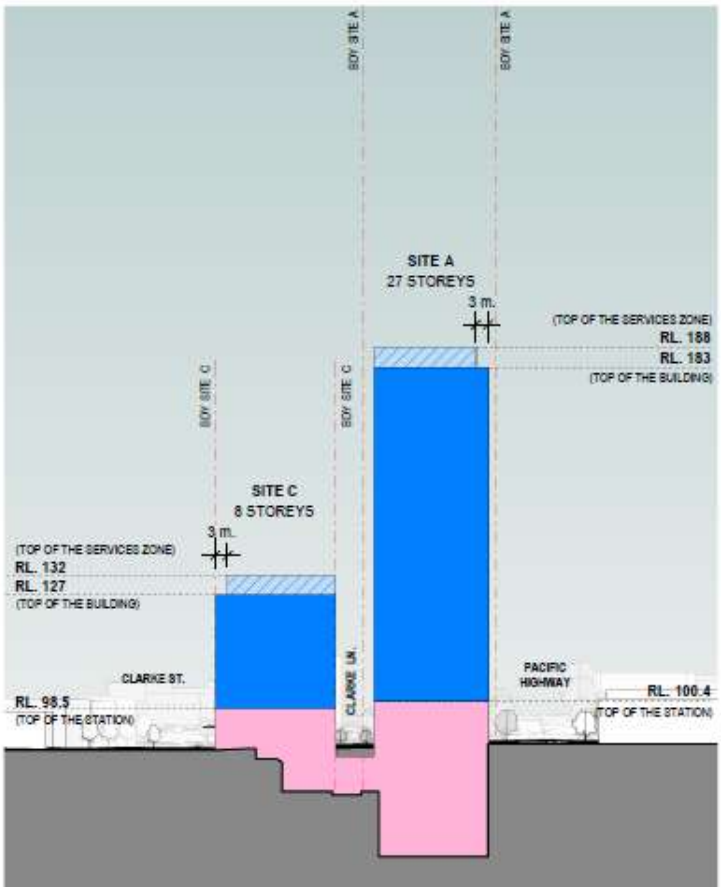


Figure 6B: Proposed Crows Nest OSD building envelopes – cross section through the site (east-west)

Figure 7: Crows Nest OSD indicative design

2.0 Scope of Assessment

This report outlines utility Service Infrastructure Assessment that has been undertaken for the OSD concept drawings prepared by Sydney Metro for the OSD at Crows Nest in support of the concept SSD Application and Secretary's Environmental Assessment Requirements (SEARs).

The assessment includes the infrastructure capacity required to service the retail tenancies and the commercial floor space in the indicative OSD design, however the physical provisions for utility connections and plant rooms below the Transfer Level are planned to be undertaken as part of the station works under the CSSI Approval. This strategy is aimed at reducing the potential for future disruption to the Metro Station and surrounding areas should the OSD construction be delayed after the completion of the station.

Design development has been undertaken in conformance with the Sydney Metro City & Southwest Chatswood to Sydenham Design Guidelines June 2017. The following tasks were also undertaken as part of this report:

- Review of relevant legislation, policies and guidelines associated with services infrastructure assessment;
- Review of PB-AECOM JV Reference Design for the Sydney Metro – City & Southwest project, (which precludes the Stage 1 Design).
- Preparation of briefing calculations to inform consultation by the Water Services Coordinator (WSC) and Level 3 Accredited Services Provider, engaged by Sydney Metro.
- Consultation with Sydney Metro Technical Advisors, (conducting 40% Stage 1 Design); in relation to utility services infrastructure and demand.

The report content incorporates a number of key utilities noted below in Table 1.

Table 1: Key Utilities

Utility	Notes
Stormwater drainage	Dedicated OSD connection to drainage network
Sewerage	Dedicated OSD infrastructure connection
Potable water	Dedicated OSD infrastructure connection
Gas	Dedicated OSD infrastructure connection
Telecommunications	Dedicated OSD infrastructure connections
Electricity	Dedicated OSD infrastructure connections

The scope of services does not consider the utilities assessment associated with the proposed Sydney Metro Station building. Due the interconnectivity of the Sydney Metro Station and OSD, references to the station services have been included to provide context for the proposed OSD concept proposal where relevant.

2.1 Assessment Summary

A series of collaborative workshops to coordinate designs have been undertaken with the Sydney Metro Technical Advisors to identify challenges and propose solutions for the supply of utility services to the OSD atop Crows Nest Station.

The assessment provides infrastructure capacity requirements to service both the commercial floor space and the retail tenancies in additional to providing an assessment of lead-in services connections to the OSD through the Crows Nest Station. The proposed utility requirements identified include the following:

Site A:

- OSD sewerage drainage connections to Clarke Lane
- OSD stormwater connections to Clarke Lane
- OSD potable water connection to Pacific Highway
- OSD (Site A, B, C) fire water connection to Pacific Highway
- OSD gas connections to Oxley Street
- OSD Electrical connection to Clarke Lane*

Site B:

- OSD sewerage drainage connections to Clarke lane
- OSD stormwater drainage connections to Clarke Lane
- OSD potable water connection to Pacific Highway
- OSD gas connection to Pacific Highway
- OSD Electrical connection to Clarke Lane*

Site C:

- OSD's sewerage drainage connections to Clarke Lane
- OSD stormwater drainage connections to Clarke Street
- OSD's potable water connection to Hume Street
- OSD gas connection to Hume Street

OSD Electrical connections have been shown indicatively in utilities plans subject to detail design at next stage. All OSD connections approvals are to be submitted by OSD team at next stage of design.

Telecommunication connections are to be advised by the maintenance team (MTR) and this is to be provided at the next stage of design.

3.0 Authorities Interface

The following section is a summary of the latest correspondence, application submissions and assessments conducted with various Utility Service Providers for the development of the Crows Nest Station OSD Design

3.1 Sydney Water Corporation

A feasibility application for the OSD water and sewerage connections as part of the Section 73 Feasibility Application for Crows Nest Station has been submitted to Sydney Water Corporation (SWC). This has been documented in Appendix B of this report. This process was also undertaken to understand if and to what extent the existing infrastructure is to be augmented for the new development.

Potable water has been accepted as per SWC Feasibility Letter response (6/11/17) with exception for the Fire Water Services which will require a new Section 73 application being made based on the expected fire flows in addition to new applications being made for the fire connections and associated pump approvals.

As the Section 73 application is only valid for 12 months, a revised application is recommended in subsequent stages of design to x ensure that application does not lapse and the OSD can connect to the SWC infrastructure. Refer to Appendix B for Sydney Metro's correspondence with SWC.

3.2 North Sydney Council

In the context of utilities, North Sydney Council (NSC) have provided Sydney Metro the necessary permissible site discharge (PSD) limits for storm water drainage discharge for the OSD sites to inform the on-site detention tank sizes.

Refer to Appendix C for Sydney Metro's correspondence with NSC.

3.3 Jemena

A preliminary assessment of Jemena's existing gas infrastructure and network's capacity to service the new developments around Sydney Metro Stations has been conducted by Sydney Metro and Jemena. The recommendations on route selection and reinforcements are subject to change with a detailed review of the proposed gas supply options and as design progresses.

Currently, Jemena has prepared a feasibility assessment of proposed developments at Crows Nest and provided budgetary cost estimates for the site. Due to the previous OSD Designs large gas load, network augmentation was required Atchison St to Oxley St, adjacent to the OSD site, to meet the required demand.

Design loads are to be resubmitted to Jemena to reconfirm the available gas supply and, if required, coordinate network augmentation works.

Refer to Appendix D for Sydney Metro's correspondence with Jemena.

3.4 Ausgrid

Sydney Metro commenced engagement with Ausgrid in 2017 to obtain Design Information Packages (DIP) for the proposed supply connection for the over-station development. However, due to the change in design load, the connection applications need to be revised.

Currently, an Ausgrid level 3 Accredited Service Provider (ASP3) has been engaged to prepare connection applications for the proposed Crows Nest Station and OSD. Project numbers have been created by Ausgrid per the received responses. These offers have been accepted by Sydney Metro and the team is awaiting DIP from Ausgrid. Once the DIP is received, the ASP3 designer will be engaged to complete preliminary design of the connections for the Sydney Metro Station and OSD.

Refer to Appendix F for Sydney Metro's correspondence with Ausgrid.

3.5 Telecommunications

Sydney Metro have conducted consultation with major telecommunications providers, Including Telstra and Optus.

The developer of the OSD will undertake further consultation as the design progresses and seek approvals based on their final design.

The development will need to be registered with the NBN Co. All external works will be done by the carriers. All internal works will be completed as part of the developer works in accordance with the carriers' requirements.

Refer to Appendix F for telecommunication updates.

4.0 Relevant Standards and Guidelines

The proposed utilities design works will comply with the applicable requirements of the below listed Standards and Design Guidelines that are relevant to the scope of the design.

In accordance with the Sydney Metro's Scope and Performance Criteria, the hierarchy of the codes and standards will be as follows:

(i) Acts and secondary legislation;

(ii) TfNSW and other NSW Government agencies' documents and standards as listed in this below. These include ASA, RMS, NSW EPA, Sydney Buses, etc.

(iii) Australian Standards and Guidelines (AS, AS/NZS, Austroads, Engineers Australia, ISCA, etc.);

(iv) International Standards (ISO, IEC, IEEE, CENELEC, ITU, etc.);

(v) European Norms (EN, TSI); and

(vi) Other relevant International standards, which must be reviewed by Sydney Metro and approved by the Independent Certifier prior to use.

Wherever two or more standards apply to the same issue, or conflicts arise between codes or standards, the more stringent must apply to resolve the conflict.

Any deviations and changes to the standards listed below will constitute a modification event to Sydney Metro.

The latest version of the following design codes, standards and guidelines will be referenced for the project design and where relevant to be incorporated as a requirement for construction. This list is not exhaustive and shall be updated as further design continues.

4.1 Australian Standards

- NCC (BCA) National Construction Code (Building Code of Australia)
- AS 1345 Identification of contents of pipes, conduits and ducts
- AS/NZS 1477 – 2006-PVC Pipes and Fitting for Pressure Application
- AS 1159 – Polyethylene pipes for pressure applications
- AS 1342 – Precast Concrete Drainage Pipes
- AS 1345 – Identification of the Contents of Piping, Conduits and Ducts
- AS 1631 – Cast Iron Non-Pressure Pipes and Pipe Fittings
- AS 2032 Code of Practice for installation of UPVC Pipe Systems
- AS 2033 Installation of polyethylene pipe systems
- AS/NZS 2033 – 2008 -Installation of Polyethylene Pipe Systems
- AS 2200 – 2006 – Design Charts for Water Supply and Sewerage
- AS/NZS 2053.1 – Conduits and fittings for electrical installations - General requirements

- AS/NZS 2053.2 – Conduits and fittings for electrical installations - Rigid plain conduits and fittings of insulating material
- AS/NZS 2053.8 – Conduits and fittings for electrical installations - Flexible conduits and fittings of metal or composite material
- AS 2566.1 – 1998-Buried Flexible Pipelines – Structural Design
- AS/NZS 2638 – 2011-Gate Valves for Waterworks Purposes
- AS 2941 – 2013-Fixed Pump set installations
- AS/NZS 3000 – Electrical installations - Buildings, structures and premises (known as the Wiring Rules)
- AS/NZS 3500 – 2015-Plumbing and Drainage
- AS 3725 – 2007-Design for Installation of Buried Concrete Pipes
- AS/NZS 4129 – 2008-Fittings for Polyethylene Pipes for Pressure Purposes
- AS/NZS 4130 – 2009-Polyethylene Pipes for Pressure Purposes
- AS 5200.000 – 2006-Plumbing and Drainage Products
- AS 5601 – Gas Installation Code
- BCA 2016-Building Code of Australia
- WSA 01 – 2004-Water Supply Code of Australia
- WSA 02 – 2014-Gravity Sewerage Code of Australia
- WSA 03 – 2011-Water Supply Code of Australia
- WSA 04 – 2005-Sewage Pumping Station Code of Australia

4.2 Guidelines

- Australian Rainfall & Runoff

4.3 RMS Specifications

- RMS 3051 RMS Specification D&C 3051 - Granular Base and Subbase Materials for Surfaced Road Pavements
- RMS 3552 Subsurface Drainage Pipe (Corrugated Perforated and Non-Perforated Plastic)
- RMS D&C 3557 - Flexible Strip Filter Drains
- RMS D&C 3058 - Aggregate Filter Materials for Subsurface Drainage
- RMS B341 RMS QA Specification B341 - Demolition of Existing Structure
- RMS Pub 13.184 Traffic Modelling Guidelines. (Issued Feb 2013)
- RMS Q6 RMS Specification D&C Q6 - Quality Management System
- RMS D&C R11 - Stormwater Drainage
- RMS D&C R83 - Jointed Concrete Base
- RMS D&C R132 - Safety Barrier Systems
- RMS D&C R44 - Earthworks
- RMS D&C R58 - Construction of Reinforced Soil Walls (Contractor's Design)

4.4 Council Standards

- North Sydney Council standards
- North Sydney Development Control Plan 2013- Complete
- North Sydney Council, Performance Guide for Engineering & Construction
- North Sydney Council, Infrastructure specification for roadworks, drainage, and miscellaneous works 2016/2017
- Development Control plan 2002 and Area Character Statements

5.0 Utilities Assessment

The following section provides the pre-existing and proposed utility services infrastructure assessment that has been undertaken for the OSD concept drawings prepared by Sydney Metro for the OSD at Crows Nest in support of the concept SSD Application SEARs.

It is noted that the utilities that serve the OSD will be completely separate from those serving the Metro station though are planned to be constructed as part of the station works under the CSSI Approval. This strategy will mitigate the requirements for additional excavation at the time of the OSD construction and reduce the impact to the Sydney Metro Station.

The connections described herein this report are subject to an application process and approval by the relevant Utility Service Provider with formal applications required to be made for their approval along with payment of the required fees.

The Dial Before You Dig (DBYD) information plans obtained for the preparation of this report may be outdated as a result of the advanced works of the Tunnel Site Excavation (TSE) Contractor with services temporarily relocated, capped or made redundant. Refer to Appendix A for Sydney Metro's "Utilities Status Document" in which the latest Crows Nest Station utilities works is available.

The Department of Planning and Environment (DPE) has released a Draft 2036 Plan Utilities Study on the 16th October 2018 for exhibition that will eventually form part of the 2036 Planning Package. Subsequent Crows Nest Utilities Assessment is to make reference to the utilities study.

5.1 Stormwater Infrastructure

5.1.1 Pre-Existing Trunk Drainage Infrastructure

North Sydney Council are the service authority responsible for the operation and maintenance of the pre-existing trunk drainage stormwater infrastructure within the Crows Nest Station site area.

A summary of the existing underground drainage infrastructure from DBYD and survey information are shown in Figure 8. Pre-existing underground stormwater drainage assets (solid blue lines) are located along the southern side of Oxley Street, the western side of Clarke Street and the southern side of Hume Street.

The Clarke Street and Oxley Street intersection drainage lines are noted to be a nominal 750mm diameter. The drainage lines along Clarke Street vary from a nominal 375 to 450mm pipeline towards the junction at Oxley Street. The drainage lines in Hume Street are noted to range between 300, 375 and 525mm nominal pipe diameters.

Figure 8: Existing Council Stormwater Drainage assets (solid blue lines) indicatively shown (North Sydney Council, 2017)

Refer to Appendix G for Further DBYD and survey information.

5.1.2 OSD Stormwater Strategy

Reference should be made to the Sydney Metro City & South West - Crows Nest Over Station Development - *"Flood Assessment and Stormwater Management"* report for details on the proposed indicative OSD design stormwater management strategy and and associated drainageb calculations. Refer to Appendix H for the currently proposesd utilities information plan.

The OSD stormwater connections are distinct from the Sydney Metro Station's stormwater systems and will be undertaken as part of the CSSI Approval process including extension from the pre-existing NSC infrastructure to the allocated OSD spatial zones above Ground Floor.

A summary of the proposed stormwater utilities connectionn strategy is shown below in Figure 9 and the following points are noted:

5.1.2.1 Site A Connection

- It is proposed to connect Ø225mm pipes from the OSD to the new drainage line to be constructured with the metro station located in Clarke Lane.
- There will be a 225mm pipe for each building and the podium deck.
- 3 detention tanks are proposed for Site A, one to service each building and one to service the podium deck.

5.1.2.2 Site B Connection

- It is proposed to connect two Ø300mm pipes from the OSD to the new drainage line to be constructured with the metro station located in Clarke Lane.
- One detention tank is proposed for Site B to service the catchment area on the roof of the OSD

5.1.2.3 Site C Connection

- It is proposed to connect a Ø300mm pipe from the OSD to the the pre-existing drainage line located in Clarke Street.
- One detention tank is proposed for Site C to service the catchment area on the roof of the OSD

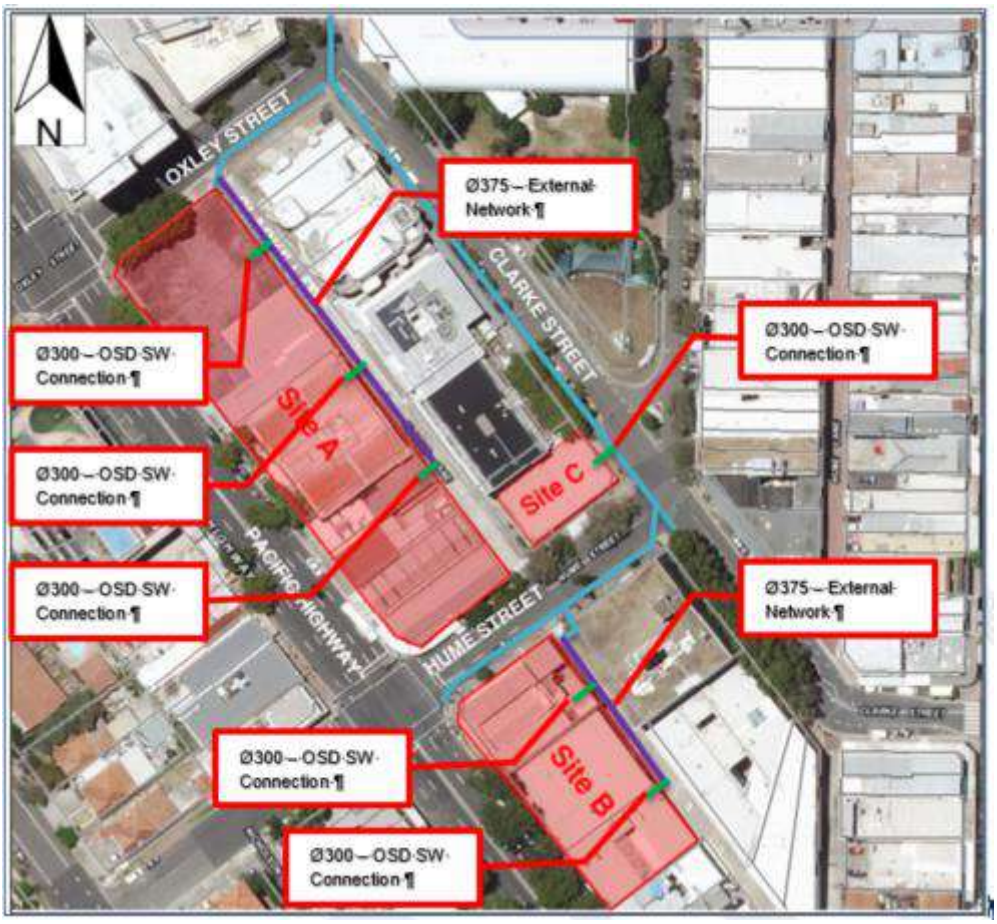


Figure 9: Existing Council Stormwater Drainage assets (solid blue lines); proposed station and OSD connections (solid green) and proposed lead-in services (solid purple) indicatively shown (North Sydney Council, 2017)

5.1.3 Proposed Stormwater Peak Discharge Assessment

Technical requirements for on-site detention are outlined in the draft Issue of the 'Sydney Metro City & Southwest- Performance Requirements Brief and the Sydney Metro City & South West - Crows Nest Over Station Development - *"Flood Assessment and Stormwater Management"* report. Such requirements include on-site detention tanks discharging to specific points along the Council stormwater system. Each of the OSD sites will require their own flow control devices and on-site detention tanks.

Detention has been sized to comply with North Sydney Council's Stormwater Management Policy and Permissible Site Discharge (PSD) for the 100-year Average Recurrence Interval (ARI):

It should be noted that these figures are indicative only, based on the indicative OSD design and may be subject to change with further design development. The performance criteria for On Site Detention is stated as the below

- Maximum PSD of **100 L/s** for Site A
- Maximum PSD of **42 L/s** for Site B
- Maximum PSD of **12 L/s** for Site C

Reference should be made to the "*Flood Assessment and Stormwater Management*" report for further detailed information on the proposed OSD peak discharge arrangements and onsite detention requirements for the site.

Any potential change of Site B use from Hotel to Commercial development will not increase permissible site discharge rates or impact the proposed OSD drainage connection strategy to the external NSC network.

5.2 Sewerage Infrastructure

5.2.1 Pre-Existing Infrastructure

Sydney Water Corporation (SWC) are the service authority responsible for the operation and maintenance of the pre-existing sewerage infrastructure within the site area.

The pre-existing infrastructure shown in Figure 10 is based on the DBYD response from Sydney Water and available survey information.

As shown in Figure 10 the pre-existing SWC sewerage mains near the site include:

- Ø225mm vitrified clay (VC) sewerage main running along Clarke lane, Oxley Street and Hume street.

Figure 10: Existing sewerage line (solid orange lines) and size; sewerage manholes (red box) indicatively shown (SWC, 2017)

Refer to Appendix G for Further DBYD and survey information.

A Feasibility Application has been lodged as part of Sydney Metros Stage 1 Design to SWC to confirm viable sewerage servicing options. The feasibility application will provide details on the pre-existing and remaining capacities of the sewerage main in the surrounding area.

Based on the feasibility letter received from SWC (Case Number 165996 & 165888), the 225mm VC sewerage main in Clarke Lane can service both the proposed Sydney Metro Station and OSD

5.2.2 OSD Sewerage Connection Strategy

The OSD sewerage connections are distinct from the Sydney Metro Station's sewerage systems and will be undertaken as part of the CSSI Approval process including extension from the pre-existing SWC sewerage infrastructure to the allocated OSD spatial zones above Ground Floor.

The proposed OSD sewerage connection strategy is indicated in Figure 11 and as further noted below. All proposed connection points to Site A, Site B and Site C are from the existing 225mm Vitrified Clay sewerage main running along Clarke Lane.

5.2.2.1 Site A Connection

It is proposed for both Site A OSD Building North and South to connect to the authority's Ø225 sewerage main in Clarke Lane. The sewer will extend and terminate at the site's boundary adjacent to the sewer boundary trap riser locations for each OSD building. Spatial allocations have been coordinated by MEP to facilitate the installation of the sewerage drainage extending from the civil capped services to the OSD spatial zone above Ground Floor.

- North OSD Building - Ø225 sewerage pipe connection is proposed, location is indicatively shown on Figure 11.
- South OSD Building - Ø225 sewerage pipe connection is proposed, location is indicatively shown on Figure 11.

5.2.2.2 Site B Connection

It is proposed for Site B OSD to connect to the authority's Ø225 sewerage main in Clarke Lane. The sewer will extend and terminate at the site's boundary adjacent to the sewer boundary trap riser location for Site B.

Spatial allocations have been coordinated to facilitate the installation of the sewerage drainage extending from the civil capped service to the OSD spatial zone above Ground Floor.

- OSD Sewerage Connection – Ø225 sewerage pipe connection is proposed, location is indicatively shown on Figure 11.

5.2.2.3 Site C Connection

It is proposed for Site C OSD to connect to the authority's Ø225 sewerage main in Clarke Lane. The sewer will extend and terminate at the site's boundary adjacent to the sewer boundary trap riser location for Site C OSD Building.

Spatial allocations have been coordinated to facilitate the installation of the sewerage drainage extending from the civil capped service to the OSD spatial zone above Ground Floor.

- OSD Sewerage Connection – Ø150 sewerage pipe connection is proposed, location is indicatively shown in Figure 11.

Figure 11: Existing sewerage line (solid orange lines) and size; sewerage manholes (red box); proposed station and OSD connections (solid green) indicatively shown (SWC, 2017)

These concept connections demonstrate that it is possible to connect the OSD to the existing water infrastructure, subject to final Sydney Water approval.

5.2.3 Sewerage Demand Assessment

A preliminary estimate for the sewerage demand for the Site A, B and C OSD Buildings has been undertaken with the demand rates noted below in Table 2, Table 3 and Table 4 It should be noted that these figures are indicative only, based on the current OSD architectural design and may be subject to change with further design development

Table 2: Site A Preliminary Sewerage Demand

Location	No. of People/Staff	Estimated Load Demand (kL/day)
Site A- Residential	360	93.0
Site A- Retail-Visitors	100	0.35
Site A- Retail-Staff	10	0.13
Site A - Total		93.5

Table 3: Site B Preliminary Sewerage Demand

Location	No. of People/Staff	Estimated Load Demand (kL/day)
Site B- Hotel Guests	375 (250 x 1.5)	32.0
Site B- Hotel Guests/Visitors	100	0.35
Site B- Hotel Staff	20	0.26
Site B - Total		32.6

Table 4: Site C Preliminary Sewerage Demand

Location	No. of People/Staff	Estimated Load Demand (kL/day)
Site C- Office Workers & Staff	240	2.6

Based upon the above sewerage demand assessment, Site B's potential change of use from Hotel to Commercial use will not increase the overall sewerage load in to the existing system and therefore have no detrimental impact to current demand assessment.

5.3 Potable Water Infrastructure

5.3.1 Pre-Existing Infrastructure

SWC is the service authority responsible for the operation and maintenance of the pre-existing potable water infrastructure within the site area.

The pre-existing potable water infrastructure shown in Figure 12 is based on the DBYD response from SWC and available survey information which indicates several pre-existing SWC assets near the site including:

- Ø100mm cast iron cement lined (CICL) potable water main running along the western side of Clarke Street and the northern side of Hume Street
- Ø150mm cast iron cement lined (CICL) potable water main running along the northern side of the Pacific Highway
- Ø200mm potable water main (material varies) running along the western side of Oxley Street

Figure 12: Existing potable water lines (solid blue lines) and sizes; existing hydrants (blue dots); existing valve (blue cross) shown (SWC, 2017)

Refer to Appendix G for Further DBYD and survey information.

A Feasibility Application has been lodged as part of Sydney Metros Stage 1 Design to SWC to confirm viable potable water servicing options. The feasibility application will give details on the pre-existing and remaining capacities of the water main in the surrounding area.

Based on the feasibility letter received from SWC (Case Number 165996), Site A can be serviced from the 200mm DICL in Oatley Street, Site B can be serviced from the 150mm CICL in Pacific Highway, and Site C can be serviced from the 100mm CICL in Clarke Street. The station can be serviced from the 150mm CICL water main in Pacific Highway (based on the SWC feasibility letter Case Number 165888).

5.3.2 OSD Potable Water Connection Strategy

The OSD potable water connections are distinct from the Sydney Metro Station's potable water supply and will be undertaken as part of the CSSI Approval process including extension from the pre-existing SWC infrastructure to the allocated OSD water meter spatial zone for each site.

The proposed OSD water connections strategy is indicated in Figure 13 and as further noted below. All proposed connection points to Site A and Site B are from the pre-existing Ø150 CICL potable water main running along the Pacific Highway with Site C connecting to the Ø100 CICL potable water main along Hume Street.

The following points are noted:

5.3.2.1 Site A Connection

It is proposed for both Site A OSD Buildings North and South to connect to the pre-existing Ø150 CICL potable water main running along the Pacific Highway. The potable water reticulation for Site A will extend and terminate at the site's boundary outside of the water meter room. Spatial allocations have been coordinated by MEP to facilitate the installation of the potable water main extending from the civil capped service to the OSD water meter room on Ground Floor.

- OSD Site A Buildings North and South - Ø150 potable cold-water connection is proposed from the Ø150 CICL potable water main running along the Pacific Highway. Location is indicatively shown on Figure 13.
- One (1) water meter room (Room No. D8C1) located on Ground Floor is proposed as shown on Appendix I

5.3.2.2 Site B Connection

It is proposed for Site B OSD Building North to connect to the existing 50mm gas mains located in Pacific Highway. The gas pipe for Site B will extend and terminate at the site's boundary adjacent to the gas meter room. Spatial allocations have been coordinated by MEP to facilitate the installation of the gas main extending from the civil capped service to the gas meter room on Basement L00 RL 91.00.

- OSD Site B - Ø100 potable cold-water connection is proposed from the Ø150 CICL potable water main running along the Pacific Highway. Location is indicatively shown on Figure 13.
- One (1) water meter room (Room No. D8C1) is proposed as shown in Appendix I.

5.3.2.3 Site C Connection

It is proposed for Site C OSD Building to connect to the pre-existing Ø100 CICL potable water main along Hume Street. The potable water reticulation for Site C will extend and terminate at the site's boundary outside of the proposed water meter room.

Site C is under design development with the location of the water meter room still to be confirmed. However, spatial allocation has been coordinated to facilitate the installation of the potable water main extending from the civil capped service to a feasible water meter room for Site C.

- OSD Site C - Ø80 potable cold-water connection is proposed from the Ø100 CICL potable water main running along Hume Street. Location is indicatively shown on Figure 13

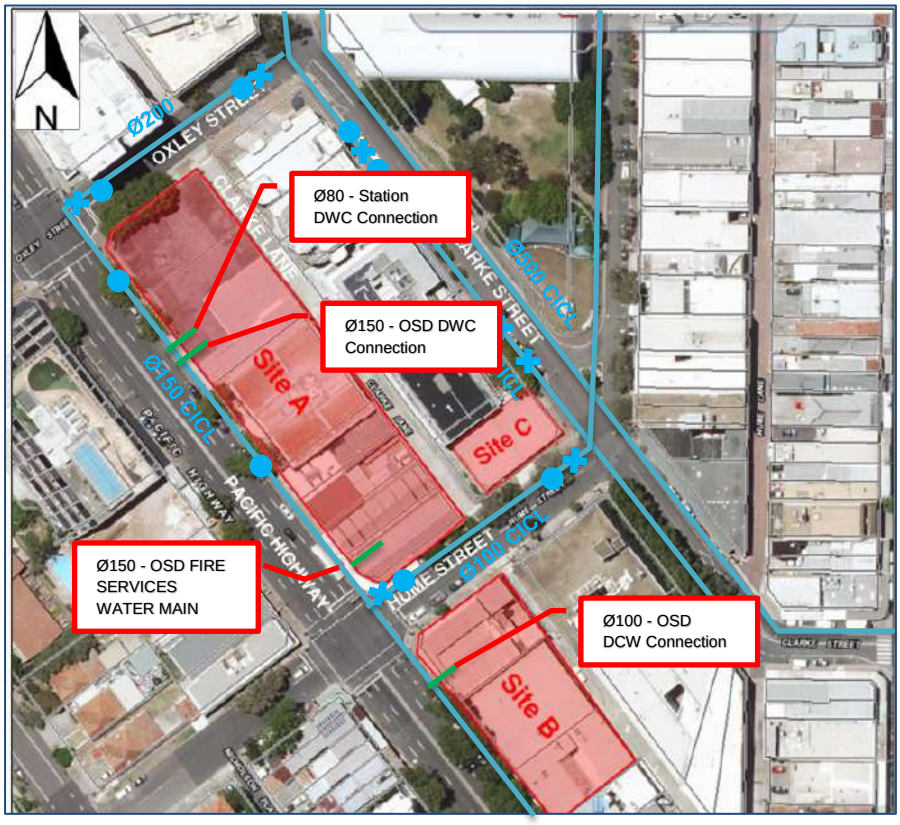


Figure 13: Existing potable water lines (solid blue lines) and sizes; existing hydrants (blue dots); existing valve (blue cross); proposed station and OSD connections (solid green) indicatively shown (SWC, 2017)

These concept connections demonstrate that it is possible to connect the OSD to the existing water infrastructure, subject to final SWC approval.

5.3.3 Potable Water Demand Assessment

A preliminary estimate for the water supply demand for the OSD buildings and retail tenancies has been undertaken with supply demand rates as noted hereunder. It should be noted that these figures are indicative only, based on the current OSD architectural design and may be subject to change with further design development

Table 5: Site A Preliminary Potable Water Demand

Location	No. of People/Staff	Estimated Load Demand (kL/day)
Site A- Residential	360	98.0
Site A- Retail-Visitors	100	0.37
Site A- Retail-Staff	10	0.135 - 0.14
Site A- Irrigation and Cooling Tower	-	137.5
Site A - Total		236

Table 6: Site B Preliminary Potable Water Demand

Location	No. of People/Staff	Estimated Load Demand (kL/day)
Site B- Hotel Guests	375 (250 x 1.5)	33.3
Site B- Hotel Guests/Visitors	100	0.37
Site B- Hotel Staff	20	0.270
Site B- Irrigation and Cooling Tower	-	44
Site B- Total		77.94

Table 7: Site C Preliminary Potable Water Demand

Location	No. of People/Staff	Estimated Load Demand (kL/day)
Site C- Office Workers & Staff	240	2.7
Site C- Irrigation and Cooling Tower	-	12.8
Site C - Total		15.5

Based upon the above water demand assessment, Site B's potential change of use from Hotel to Commercial use will not increase the overall water demand and therefore have no detrimental impact to current demand assessment.

5.3.4 Proposed OSD Fire Services

5.3.4.1 Connection Strategy

The fire services for the OSD sites are proposed to be a combined system based on a precinct-wide approach, i.e. one combined fire hydrant/sprinkler system (1) x system to serve Site A + Site B + Site C.

The proposed OSD fire water connection strategy is indicated in the previous Figure 13. The connection point for the combined fire system is from the pre-existing Ø150 CICL potable water main running along the Pacific Highway.

The combined fire main will extend and terminate at the site's boundary outside of the FRNSW booster enclosure. Spatial allocations have been coordinated by MEP to facilitate the installation of the fire main extending from the civil capped service to the booster enclosure. The booster enclosure is located facing the Pacific Highway on the south end of Site A at a central location to the three sites.

The booster has been space proofed to allow for separate inlets for each sub-ring main considered. This allows for multiple pressure zones to be allowed for in each building, and fire relay pumps have been allowed for in each development to facilitate this.

Reticulation of the fire pipes will run underneath Hume Street and Clarke Lane and above the Crows Nest Station structure to connect Sites A, B and C. This will provide a ring main to serve the Crows Nest precinct from a single system.

5.3.4.2 Water Demand

The fire services systems demand is based on the highest hazard occupancy within the Crows Nest development; the indicative OSD design has predominantly commercial and retail spaces hence Ordinary Hazard 3 occupancy as defined in AS 2118.1 has been used as a basis for the system demand.

The basis of the fire services system demand regarding flow and water storage capacity has been undertaken with flow and storage rates noted below in Table 8. It should be noted that these figures are indicative only, based on the indicative OSD design and may be subject to change with further design development.

Table 8: Preliminary Fire Services Water Demand

Fire Systems	Estimated Flow Demand	Basis of Design	Estimated Total System Flow	Estimated Total Water Storage Capacity
Sprinklers	1080 L/min	Density = 5mm/min Area of Operation = 216m2 (AS 2118.1)	46 L/s	110 000L
Hydrants	1200 L/min	2 hydrants @ 600L/min each		

The fire water supply for the retail tenancies and commercial building is a consolidated supply with branch connections from the fire valve room. The connection from the Town's Main for the fire water supply will include a backflow prevention device with a metered by-pass connection provision required by SWC.

The water supply to the on-site fire water tanks shall be capable of completely refilling the tanks within 6 hours (for tanks less 500kL capacity) in accordance with AS 2118.1: 4.8. The proposed inflow to the fire water tank based on the above capacity will be minimum 7 l/s.

Based upon the above fire services demand assessment, Site B's potential change of use from Hotel to Commercial use will not increase the overall fire loading and therefore have no detrimental impact to current demand assessment.

5.4 Water Reuse Strategy

SWC has no reticulated recycled water infrastructure servicing the proposed OSD sites. Water efficiency and sustainability for the OSD development will be achieved through on-site rainwater harvesting and re-use to supplement toilet flushing, irrigation, hose taps for wash down.

Spatial allowance for two (2) x 50M3 effective capacity rainwater tanks with associated plantrooms are allocated on Level 4 of Site A North and South residential building based on 50% plantroom roof catchment(550M2) for each building;

For Site B, spatial allowance for one (1) x 50M3 effective capacity rainwater tank with associated plantroom has been allocated on Level 2 based on 50% hotel plantroom roof catchment (600M2).

For Site C, spatial allowance for one (1) x 25M3 effective capacity rainwater tank with associated plantroom has been allocated based on 50% plantroom roof catchment (285M2).

It should be noted the capacity of the rainwater storage and roof catchment is indicative only based on current architectural design and may be subject to change with further design development.

5.5 Gas Infrastructure

5.5.1 Pre-Existing Infrastructure

Jemena is the service authority responsible for the operation and maintenance of the pre-existing pressurised gas infrastructure within the site area.

Based on the DBYD and survey information, Jemena have a number of assets in the vicinity of the site as indicated in Figure 14. These assets include:

- 50mm Nylon Line (210kPa) along the eastern side of Clarke Street, the northern side of Hume Street, the western side of Pacific Highway and the eastern side of the Pacific Highway starting.

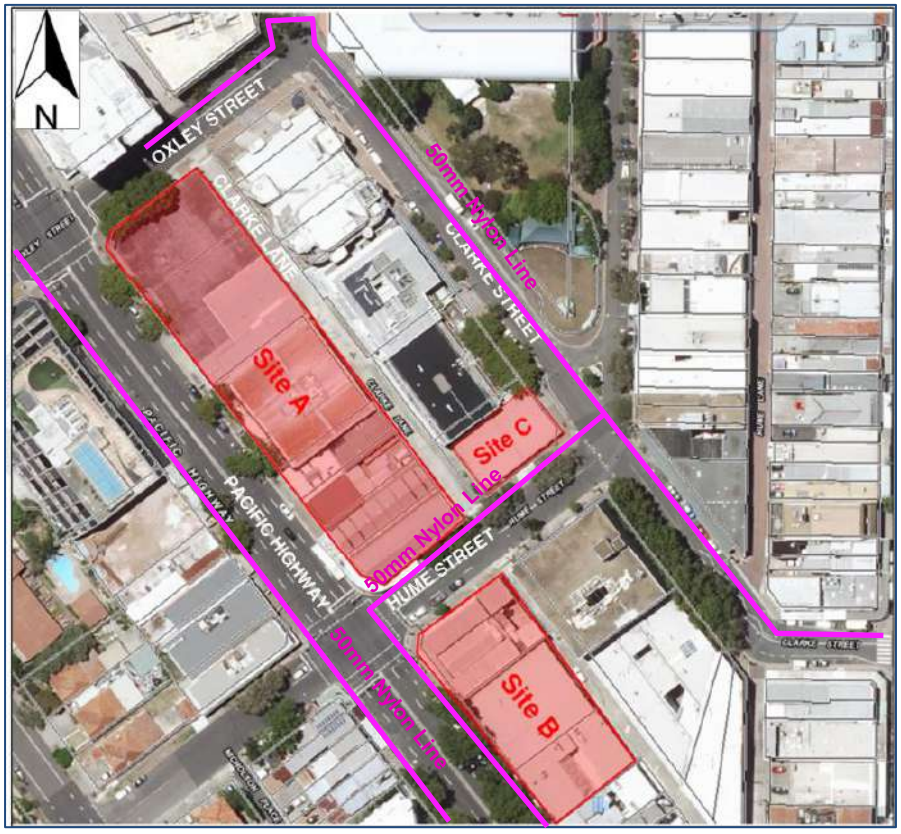


Figure 14: Existing Jemena assets (solid pink lines) indicatively shown (Jemena, 2017)

5.5.2 OSD and Retail Gas Connection Strategy

The OSD gas connections are distinct from the Sydney Metro Stations system with spatial allowance outside of the Station's box and will be undertaken as part of the CSSI Approval process including extension from the pre-existing Jemena gas infrastructure to the allocated OSD gas meter room spatial zone for each site.

Due to the previous OSD designs significant gas loads to service Site A, B and C, it was proposed that an upgrade of Jemena's reticulation was required in the vicinity of the OSD sites.

The upgrade work proposed incorporates the installation of one Cocon (high pressure regulator) on Atchinson Street and install approximately 210 metres x Ø110PE from the outlet of the Cocon along Oxley Street to adjacent of Site A.

Site B and C can be serviced off the Ø50 NY main along Pacific Highway and Hume Street respectively.

The proposed jemena upgrade is to be reassessed based upon the revised gas loads in section 5.5.4. Currently, the proposed OSD gas connection strategy is shown below in Figure 15 and the following points are noted:

5.5.2.1 Site A Connection

It is proposed for both Site A OSD Buildings North and South to connect to the new Ø110 gas mains to be installed along Oxley Street. The gas pipe for Site A will extend and terminate at the site's boundary adjacent to the gas meter room. Spatial allocations have been coordinated by MEP to facilitate the installation of the gas main extending from the civil capped service to the gas meter room on Ground Floor.

- OSD Site A Buildings North and South - Ø50 gas pipe is proposed from the Ø110 gas mains in Oxley Street. Location is indicatively shown on Figure 15.
- One (1) gas meter room (Room No. D8C2) located on Ground Floor is proposed as shown in Appendix I

5.5.2.2 Site B Connection

It is proposed for Site B OSD Building North to connect to the existing 50mm gas mains located in Pacific Highway. The gas pipe for Site B will extend and terminate at the site's boundary adjacent to the gas meter room. Spatial allocations have been coordinated by MEP to facilitate the installation of the gas main extending from the civil capped service to the gas meter room on Basement L00 RL 91.00.

- OSD Site A Buildings North and South - Ø50 gas pipe is proposed from the 50mm gas mains located in Pacific Highway. Location is indicatively shown on Figure 15.
- One (1) gas meter room (Room No. D8C2) located on Basement L00 RL 91.00 is proposed as shown in Appendix I

5.5.2.3 Site C Connection

It is proposed for Site C OSD Building to connect to the pre-existing 50mm gas main located in Hume Street. The gas pipe for Site C will extend and terminate at the site's boundary.

Site C is under design development with the location of the gas meter room still to be confirmed. However, spatial allocation has been coordinated to facilitate the installation of the gas pipe extending from the civil capped service to a feasible gas meter room for Site C.

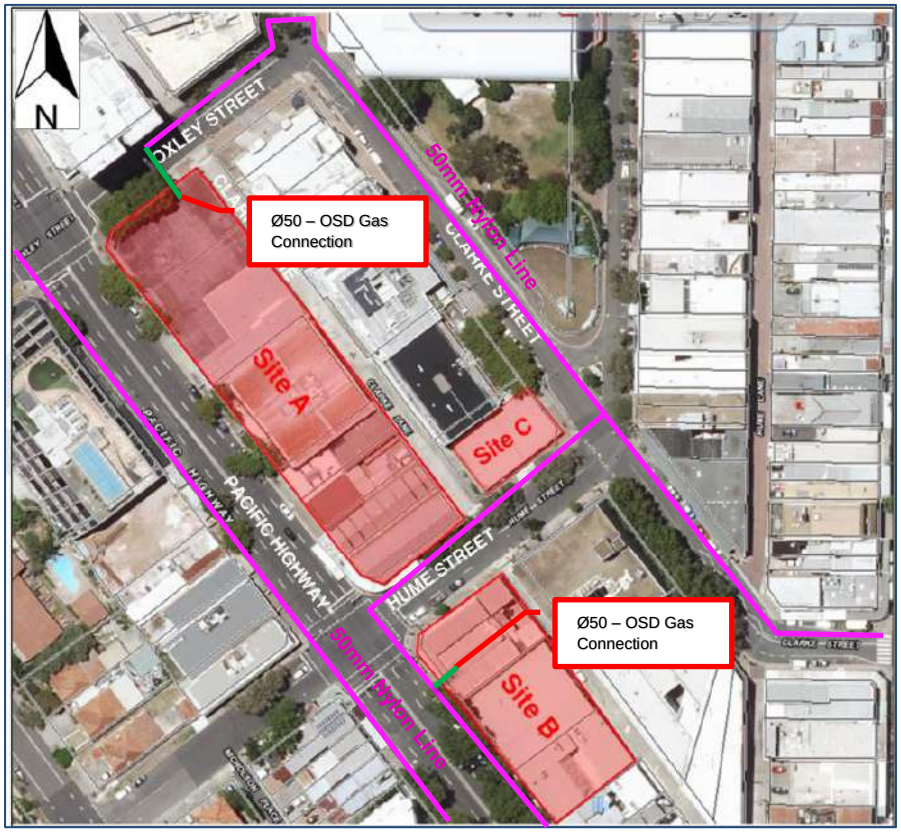


Figure 15: Existing Jemena assets (solid pink lines); proposed station and OSD connections (solid green) indicatively shown (Jemena, 2017)

The final location of connections and the location allocated for the gas boundary regulators and gas meters are subject to authority approval and require further discussion at subsequent stages of design.

Note that all gas service reticulation serving the OSD buildings will be kept outside of the station boxes.

5.5.3 Gas Considerations

A gas boundary valve will be provided outside each of the OSD's building's boundary.

Jemena gas meters and regulators are proposed to be located within a dedicated room with direct street access.

Each gas meter and regulator room will contain:

- The Authority's boundary regulator;
- The Authority's commercial OSD building gas meter;
- The Authority's gas meters for the retail tenancies.

It is proposed for the gas service for each OSD building to extend from the gas regulator and meter:

- To each mechanical plantroom;
- To each domestic hot water plant of each building;
- To each residential hot water gas meter cupboard on each typical floor of the residential buildings.

Jemena prepared a feasibility report in 2017 for the Crows Nest site based on (now redundant) design information. The connection scheme proposed by Jemena for the 81GJ load included extensive network augmentation in Atchison Street and works down Oxley Street to supply the load.

The gas load for the development has been revised to 27.5GJ. A request is with Jemena to review the supply requirement, network augmentation still may be required to accommodate the OSD loads.

The expected gas load is significantly less to previous OSD options and will not impact on pre-existing work carried out by Jemena.

5.5.4 Gas Demand Assessment

A preliminary estimate for the gas supply demand for the OSD buildings and retail tenancies has been undertaken with gas supply demand as noted hereunder. It should be noted that these figures are indicative only, based on the current OSD architectural design and may be subject to change with further design development

Table 9: Site A Preliminary Gas Load

Location	No. of People/Staff	Estimated Gas Load Demand (Mj/h)
Site A- Residential Apartments (Domestic Hot Water & Gas Cook Top)	360	8,160
Site A- Residential Mechanical Heating	-	7,080
Site A- Retail Shops	-	1,000

Table 10: Site B Preliminary Gas Load

Location	No. of People/Staff	Estimated Gas Load Demand (Mj/h)
Site B- (Hotel Domestic Hot	375	5,100

Location	No. of People/Staff	Estimated Gas Load Demand (Mj/h)
water & Commercial Kitchen)	(250 x 1.5)	
Site B- Hotel Mechanical Heating	-	4,480

Table 11: Site C Preliminary Gas Load

Location	No. of People/Staff	Estimated Gas Load Demand (Mj/h)
Site C- Office Domestic Hot water	240	410
Site C- Mechanical Heating	-	1,190

Based upon the above gas demand assessment, Site B's potential change of use from Hotel to Commercial use will not increase the overall gas demand and therefore have no detrimental impact to current demand assessment.

5.6 Telecommunication Infrastructure

5.6.1 Pre-Existing Infrastructure

There are a number of pre-existing telecommunications carriers surrounding the site. Based on the DBYD information (Appendix G), Telstra, Optus, NEXTGEN, and Verizon Business all have services along Hume Street, Pacific Hwy and Oxley Street – refer to Figure 16. Also, according to the NBN website, NBN services is available in the planned zone, as this is a major development, a dedicated fibre system will be required to service the apartments, hotel and commercial building.

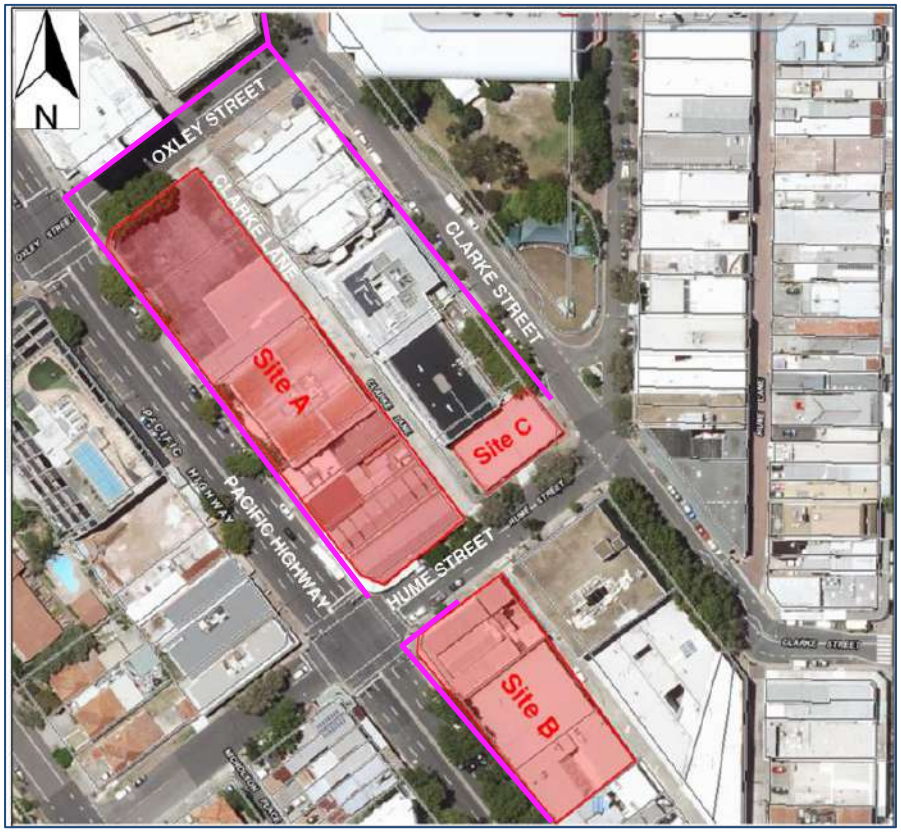


Figure 16: Existing telecommunications lines (solid magenta lines) indicatively shown

5.6.2 OSD Connection Strategy

The OSD telecommunication connections are distinct from the Sydney Metro Station's telecommunication systems and will be undertaken as part of the CSSI Approval process including extension from the pre-existing external infrastructure to the allocated OSD spatial zones above Ground Floor.

Building Distributor Rooms (BDR) shall be provided for each of the development's buildings to facilitate the NBN Co lead-in equipment as well as the Commercial and Retail tenancies arranged telecommunications infrastructure.

Building entry lead-in conduits are to interface with pre-existing carrier infrastructure (Telstra, Optus, Verizon, NEXTGEN and future NBN services). Cabling within each building shall be provided by the NBN Co.

Refer to Appendix H for the proposed external connection strategy.

5.6.3 Voice and Data Systems Configuration

Building A North & South - Residential building cabling will be provided by NBN Co. to each level. The base building services shall have telecommunications riser space to accommodate NBN Co. cabling and a dedicated NBN Co. cupboard on each level to house NBN Co. termination equipment to service individual residential units.

Building B – Hotel building cabling will be provided by NBN Co. to the BDR with the base building services providing telecommunications riser space to each floor level, to a Floor Distributor Room (FDR), which will accommodate voice/data equipment.

Building C – Community Area building cabling will be provided by NBN Co. to the Building BDR with the base building services providing telecommunications riser space to accommodate the lead-in fibre cabling.

5.7 Electrical Infrastructure

5.7.1 Pre-Existing Infrastructure

The OSD's site is located within the Ausgrid electricity supply network. Design and provision for the indicative OSD Design connections will occur as part of the CSSI approved works. The substation and connections will be part of the Indicative OSD Design works.

There are multiple pre-existing Ausgrid substations identified on the Ausgrid DBYD plans within/nearby the development zone, see Figure 17. The substations appear to supply low voltage to a number of properties adjacent to the site and associated street lighting. This substation situated in site A will be decommissioned as part of the CSSI approved works.

Figure 17: Existing underground cable runs (solid red lines); overhead cables (dashed red lines); pad mount substation (yellow box) indicatively shown (Ausgrid, 2017)

Sydney Metro commenced engagement with Ausgrid in 2017 to obtain Design Information Packages for the proposed supply connection for the over-station development. However,

due to the change in design load, the connection applications will be revised and resubmitted.

5.7.2 OSD HV Connection Strategy

The OSD HV connections are distinct from the Station's telecommunication systems and will be undertaken as part of the CSSI Approval process including extension from the pre-existing external infrastructure to the allocated OSD spatial zones above Ground Floor.

The proposed supply to the development shall be from underground high voltage cables leading in from Clarke Lane to a substation room located inside the building. This scheme is subject to final approval from Ausgrid. Please note that further coordination is required with the ASP3 designer and the Station design.

The HV cabling will be installed in a three hours fire rated concrete encasement until it enters the substations subfloors. The chamber substations will be a two hours fire rated enclosure.

5.7.3 Maximum Demand Assessment

The maximum demand has been calculated based on the current OSD architectural design.

Table 12 - Preliminary EMD Calculation

Building A North & South (Twin Residential Buildings)

Number of Apartment	Retail m^2	Commercial m^2	BOH / Plant / Carpark m^2	Lifts	Estimated EMD (kVA) – incl. 10% Spare	Proposed Substation Configuration
350	750	800	23,000	8+4	2,634	3 x 1,000kVA

Building C (Community and Commercial Building)

Commercial m^2	BOH / Plant / Carpark m^2	Lifts	Estimated EMD (kVA) – incl. 10% Spare	Proposed Substation Configuration
1,200	1,500	2	220	Fed from Building A

Building B (Hotel Building)

Hotel m^2	Retail m^2	Commercial m^2	BOH / Plant / Carpark m^2	Lifts	Estimated EMD (kVA) – incl. 10% Spare	Proposed Substation Configuration
7,200	650		6,400	4+2	1,200	2 x 750kVA

Note: the maximum demand is based on AS/NZS3000 Table C3 and also NS109 Table B:

- No diversity
- 100VA/m2 of commercial/community
- 120VA/m2 of retail
- 80VA/m2 for hotel room space (bar fridge, no cooking facilities)
- 15VA/m2 for plant/carpark and BOH areas
- 5000VA/apartment (gas cooktop and centralised gas hot water)
- 10% spare for future design flexibility

Based upon the above maximum demand assessment, Site B's potential change of use from Hotel to Commercial use will not increase the overall electrical demand and therefore have no detrimental impact to current demand assessment.

The staging of the electrical services is to be co-ordinated with the contractor in subsequent stages of design.

5.7.4 Substation Infrastructure Arrangement

Based on the current maximum demand and Ausgrid information for substations firm rating (NS 109), the total number of chamber substation will be as follows (Refer also to Table 12):

- Building A North & South – elevated chamber substation - 3 x 1,000kVA Transformers
- Building B – elevated chamber substation – 2 x 750kVA Transformers

Building A substation is facing Clark Lane for the transformers' access and removal via louvre. Building B substation has allowed equipment hatch to drop down transformers to loading dock space for delivery. The current proposal is for all Ausgrid HV underground mains to come from Clarke Lane. All substations size calculations are based on NS109.

6.0 Protection of Pre-Existing Utility Infrastructure

As the Crows Nest OSD sits atop the Metro station, there are no earth works associated with the OSD project. These works will be undertaken as part of the station works under the CSSI Approval. As such the protection of pre-existing in ground infrastructure is being undertaken as part of the CSSI approved works.

The approved CSSI works must be constructed in accordance with Sydney Metros Scope and Performance criteria below:

- All the Utility Services (including overland flow paths) potentially affected contractors and subcontractor's activities will be identified to determine requirements for adjustment, protection and support. This will be undertaken in consultation with the relevant Utility Service owner or Authority
- All Utility Services required for contractors and subcontractor's activities will be identified, and all necessary things will be done to provide and maintain connections to such Utility Services to the Sydney Metro Station works and the Temporary Works.

For Stage 1 design, the Sydney Metro Technical Advisors were provided with detailed survey of the horizontal geometry of utilities. Further detailed survey is required at the next stage of design for vertical depths of utilities to ensure sufficient clearances and cover for all services. The CSSI Approved works is to consider any temporary TSE Contract works that have occurred, with the need to minimise relocation of pre-existing utilities shall be considered during the following design stages.

See Appendix G for DBYD and survey information.

7.0 Conclusion

This report outlines the Services Infrastructure Assessment that has been undertaken for the OSD concept drawings prepared by Sydney Metro for the OSD at Crows Nest in support of the concept SSD Application and Secretary's Environmental Assessment Requirements (SEARs).

The Crows Nest OSD utility service design is an integrated solution that serves the OSD and Sydney Metro Station. The OSD utility services will be completely separate from those serving the Metro station though are planned to be constructed as part of the station works under the CSSI Approval. This will reduce the potential for future disruption to the Metro Station and surrounding areas should the OSD construction be delayed after the completion of the Metro Station.

Due to the advanced works of the TSE Contract, information plans obtained for the preparation of this report may, services may be outdated, temporarily relocated, capped or made redundant. It is imperative that the future OSD designer will seek the latest TSE contractor and survey information.

Based on the Crows Nest Stations OSD Services Infrastructure Assessment and preliminary consultation between Sydney Metro and the relevant Utility Services Providers, it is believed that there is either sufficient capacity in the pre-existing infrastructure or upgrade works can be provided to accommodate the proposed indicative OSD Design.

With the proposed reduction in building floor area and volume, the associated demand requirements for water, sewer, gas, electricity and communications are also to be reduced.

As per the specific requirements of individual Utility Services Providers, the developer of the OSD will be required to undertake more detailed enquiries and arrange for final connections and associated approvals in subsequent stages of design.

Appendix A

Utilities Status Document

Note: References made in Utilities Status document have been provided in Appendices B - F

Integrated Station Development – Crows Nest
Utilities Status Document

Sydney Metro City & Southwest

Applicable to:	Sydney Metro City and Southwest – Station Development Crows Nest
Author:	Paul Rogers
Plan owner:	Utility & Stakeholder Manager
Issued to:	Internal Review
Status:	Issued for review
Version:	E
Date of issue:	24.08.2018
Review date:	
Security classification:	For Information Only

Table of Contents

1. Introduction

The Sydney Metro City & Southwest project will continue the Sydney Metro Northwest (currently under construction) from Chatswood to North Sydney, Sydney CBD and Bankstown. The City portion will include 17km of new tunnel from Chatswood, under the harbour to Sydenham connecting 7 new underground stations at Crows Nest, Victoria Cross, Barangaroo, Pitt Street, Martin Place, Central and Waterloo. The southwest portion will include an upgrade of 13km of existing railway track and 11 aboveground stations on the Bankstown line including Sydenham, Marrickville, Dulwich Hill, Hurlstone Park, Canterbury, Campsie, Belmore, Lakemba, Wiley Park, Punchbowl and Bankstown. Integrated station development is proposed at each of the new stations on the Sydney Metro City & Southwest (except Central or Barangaroo).

The purpose of this document is to inform the proponents of the Crows Nest Station Contract:

- Type of Utilities with whom Sydney Metro will interface;
- Utility amendment scope of works to be completed by others prior to Station Contractor mobilisation;
- Utility amendment scope of works to be completed by the Station Contractor;
- Status of utility works (at time of writing).

Excavation works for the stations are currently being undertaken by the Sydney Metro Tunnelling and Station Excavations (TSE) Contractor. The work is being delivered by a joint venture between John Holland Pty Ltd, CPB Contractors Pty Ltd and Ghella Pty Ltd and is expected to be completed in 2020.

2. Utilities

The Sydney Metro project will impact upon 22 discrete utility authorities' assets, which are both publicly and privately owned. The Utility authorities are:

Utility Owner	Asset Type
Sydney Water	Water
Sydney Water	Sewer
Sydney Water **Council - Various** **Roads & Maritime Services**	Stormwater Stormwater Stormwater
Jemena	Gas
Ausgrid **TransGrid**	Electricity Electricity
Telstra **Optus/Uecomm** **NBN Co** **TPG (AAPT/Powertel/PipeNetworks)** **Verizon/Worldcom** **AARNet** **Vocus (Amcom / M2 / Dodo / iprimus / Engine / Commander /Nextgen/Visionstream)**	Telecommunications Telecommunications Telecommunications Telecommunications Telecommunications Telecommunications Telecommunications

{This document remains 'live' and will be updated throughout the life of the project as knowledge is gained and works developed.}

3. Crows Nest

The new Crows Nest station will be located on Pacific Highway across Hume Street. A summary of the utilities works associated with the station is provided below:

Utility Owner	Work by Others	Work by Station Contractor
Ausgrid	- Installation of ABCs - Decommission substation at 511 – 519 Pacific Highway (replacement substation required to be located at 14 Clarke Street) - Install HVC kiosk substation on Hume St (on the side of 14 Clarke St) - Relocation of HV overhead and LV underground from Hume Street to 495 Pacific Highway, through a steel pipe	- Connection request - Reinstate HV / LV in Hume St (design TBC) - Decommission HVC kiosk (pending outcome of item 1 below)
Jemena (Gas)	- Cut & cap medium pressure gas main in Hume St	- Connection request - Reinstate gas main in Hume St (design TBC)
Sydney Water (Potable water)	- 100mm CICL removed from Hume St	- Connection request (station and development) - Reinstate 100mm CICL main in Hume St (design TBC)
Sydney Water (Sewer)	- Breakout existing 225mm VC in Hume St and replace with steel pipe free spanning beneath a temporary bridge with a 375mm PVC pipe sleeved inside. - Breakout existing 225mm VC in Clarke Lane and replace with steel pipe free spanning beneath a temporary bridge with a 375mm PVC pipe sleeved inside (Ref 18).	- Connection request (station and development) - Reinstate sewer main in Hume St (design TBC)
Sydney Water (Stormwater)	- Nil	- Connection request (station and development)
Telstra	- Relocation of A100 conduit from Hume St to temporary bridge (incl. Vocus) - Decommission services to 475 – 477 Pacific Hwy, 495 Pacific Hwy, 497 Pacific Hwy, 501-509 Pacific Hwy, 511-515 Pacific Hwy, 521-539 Pacific Hwy and 14 Clarke St - Decommission mains copper on	- Reinstate Telstra (and Vocus asset) in Hume St (design TBC)

Utility Owner	Work by Others	Work by Station Contractor
	Hume St at Pacific Hwy intersection	
Optus	- Relocation of P100 conduit from Hume St to temporary bridge	- Reinstate Optus in Hume St (design TBC)
North Sydney Council (stormwater)	- Relocate DN525 asset from Hume St to temporary bridge	- Reinstate council stormwater in Hume St (design TBC)

Utility works:

1. Ausgrid

    a) An Ausgrid ASP3 (UEA) has been engaged to prepare connection applications based on load information provided by the Sydney Metro designers for the proposed Crows Nest Station and over-station development (refer to Ref 7). Project numbers have been created by Ausgrid per the received responses (refer to Ref 8). These offers have been accepted by Sydney Metro and the team is awaiting Design Information Package (DIP) from Ausgrid. Once the DIP is received, UEA will be engaged to complete preliminary design of the connections. Station Contractor to continue with connection request.

    b) TSE Contractor will install ABCs in place of existing bare overhead mains on Oxley Street, Hume Street and Charles Street. The works will be completed per the certified design (refer to Refs 9 & 10).

    c) TSE Contractor will install a new HVC kiosk substation on Hume Street (on the side of 14 Clarke St). The works will be completed per the certified design (refer to Refs 11 & 12). This HVC kiosk will be left on site for use by the Station Contractor during construction. The Station Contractor will need to complete an electricity supply application and updated ISMP to transfer the kiosk to the Station Contractor.

    d) Upon Station Contractor demobilisation, the HVC kiosk described in item 1.c) above must be decommissioned and returned to Ausgrid (the HVC kiosk is an Ausgrid asset). This will require a project application to Ausgrid and subsequent certified design.

    e) If the Station Contractor determines that the HVC kiosk (described in item 1.c) above) will not be required, Transport for NSW must be notified during the RFT phase. Upon receipt of notification, Transport for NSW will decommission the HVC kiosk prior to Station Contractor mobilisation.

    f) TSE Contractor will decommission a substation for Clarke Oxley (located 511 – 519 Pacific Highway). The works will be completed per the certified design (refer to Ref 13 & 14) and involves establishment of a new substation at 14 Clarke Street.

    g) TSE Contractor will relocate HV & LV from Hume Street through a steel pipe in 495 Pacific Highway. This will be completed per the certified design (refer to Refs 15 & 16).

    h) Station Contractor will relocate the HV & LV from the temporary steel structure described in item 1.g) above. The final alignment of the HV & LV is to be determined in conjunction with Ausgrid.

2. Jemena:

    a) Jemena has prepared a feasibility assessment of proposed developments at Crows Nest, Victoria Cross, Pitt Street South, and Marrickville (refer to Ref 1). Budgetary cost estimates have also been prepared for these sites (refer to Ref 6). Due to the large

load, network augmentation is required to meet demand. Station Contractor is to confirm the design load and coordinate network augmentation works with Jemena.

b) TSE Contractor will cut and cap the medium pressure gas main in Hume Street to enable excavation for the station.

c) Station Contractor will reinstate the medium pressure gas main in Hume Street. Design of the reinstated gas main will be completed in conjunction with Jemena.

3. Sydney Water

a) Station Contractor to obtain Section 73 Certificate from Sydney Water Corporation for water, sewer and stormwater works. A Water Services Coordinator (Warren Smith & Partners) was engaged by Sydney Metro to complete an application for feasibility analysis to Sydney Water for the Crows Nest Station (refer to Ref 2) and the Crows Next over-station development (refer to Ref 3). Sydney Water has provided responses to the feasibility analyses (refer to Refs 4 & 5 for the Station and OSD respectively).

b) TSE Contractor will cut and cap the 100mm CICL water main in Hume Street outside of the excavation area for the station box. The TSE contractor will break out existing 225mm VC sewer at both Hume Street and Clarke Lane where they cross the station excavation and 225mm VC sewer. They will replace these sewers with 375mm PVC pipes sleeved beneath temporary steel bridging structures to span the station box excavations. Relocation designs have been completed. These drawing have been provided, along with a copy of the Sydney Water Letter of Requirements, for reference (Ref 18).

c) Station Contractor to reinstate the water and sewer mains described in item 3.b) above in Hume Street and Clarke Lane as per the design agreed with Sydney Water (TBC).

d) There is 1 construction driveway being established or utilised by the TSE Contractor for the works associated with the Crows Nest Station. There is a DN150 CICL water main underneath the driveway, fronting 521 Pacific Highway. Sydney Water has assessed the proposal by the TSE Contractor and considers that the mains will be impacted by the works. Sydney Water has issued a Notice of Requirements to Sydney Metro (refer to Ref 20). The TSE Contractor proposed to complete a condition assessment of Sydney Water assets within the driveway pre- and post-construction. Any defects identified in the post-construction condition assessment will be repaired by the TSE Contractor. This alternative Adjustment Works been accepted by Sydney Water. A copy of correspondence has been provided for reference (Ref 21).

e) Station Contractor is to complete pre- and post-construction condition assessments of Sydney Water assets within the construction driveways (as described in item d) above). Any defects identified in the post-construction condition assessment are to be repaired by the Station Contractor.

4. Telstra

a) TSE Contractor will decommission the main in Hume Street at the Pacific Highway intersection, as well as services at 6 locations on the Pacific Highway and 1 location on Clarke Street. Confirmations of decommissioning will be provided to the tenderer when received from TSE.

b) TSE Contractor will relocate A100 conduit from Hume Street to temporary bridge (refer to Ref 17).

c) Station Contractor to reinstate Telstra asset in Hume Street (design TBC).

5. Optus

a) TSE Contractor will relocate asset from Hume Street to temporary bridge. Refer to Ref 19 for details.

b) Station Contractor to reinstate Optus asset in Hume Street within an alignment agreed with Optus (design TBC).

6. North Sydney Council

a) TSE Contractor will relocate DN525 stormwater asset from Hume Street a pipe connected beneath the temporary bridge deck (Ref 22).

b) Station Contractor to reinstate stormwater asset within Hume Street (design TBC).

4. Reference Documents

Ref. No	Document
1	Jemena Sydney Metro Developments Servicing Proposal (Crows Nest, Vic Cross, Pitt Street South, Marrickville)
2	Sydney Water Case 165888 Application Crows Nest Station
3	Sydney Water Case 165996 Application Crows Nest OSD
4	Sydney Water Case 165888 - Feasibility Letter – Final Crows Nest Station
5	Sydney Water Case 165996 - Feasibility - Final Crows Nest OSD
6	Jemena SM Gas connection feasibility estimate
7	Ausgrid Crows Nest Connection Application
8	Ausgrid Crows Nest Connection Offer
9	Ausgrid LV ABC certified design letter SC09547 - 20170411 - LT05B ASP3 design certified
10	Ausgrid LV ABC certified design drawing SC09547 Certified Design Amd 0
11	Ausgrid HV feeder certified design letter SC09402 - 20170602 - LT05B ASP3 design certified
12	Ausgrid HV feeder certified design drawing SC09402 Certified Design Amd 0
13	Ausgrid substation decommissioning certified design letter SC08723 - 20170602 - LT05B ASP3 design certified
14	Ausgrid substation decommissioning certified design SC08723 Certified Design Amd 0
15	Ausgrid relocation certified design letter SC09404 - 20171121 - LT05B ASP3 design certified
16	Ausgrid relocation certified design drawing SC09404 Certified Design Amd 0
17	Telstra relocation design SOW_19.12.17
18	Sydney Water Notice of Requirements – Case CN166589. Document package includes Letter of Notice of Requirements, Relocation drawings for sewer, Cut & cap drawings for potable water
19	Optus civil design – relocation outside of Hume St
20	Sydney Water Notice of Requirements – CN168995 construction driveways *Package includes TSE driveways assessment*
21	Sydney Water Response - Driveway BOA
22	North Sydney Council stormwater relocation design. *Package includes Hume Street Bridge General Arrangement Sheets 1 and 2; Hume Street Bridge Deck Concrete Sheet 4*

Appendix B

Sydney Water Corporation

Sydney WATER

19 September 2018

Annie Leung
Team Leader, Key Sites Assessments
Department of Planning and Environment
GPO Box 39
Sydney NSW 2001

RE: Input on SEARs, Sydney Metro – Crows Nest Over Station Development (OSD) SSD 9579

Thank you for the opportunity to comment on Secretary's Environmental Assessment Requirements (SEARs) on a concept development application for Crows Nest Over Station Development (OSD). Sydney Water have actively engaged with the Sydney Metro Project regarding the mitigation of impacts to our assets before and during construction, and operations.

During this engagement we have provided the following requirements to be considered where they will be impacted on Sydney Water assets:

1. Demand Calculations

Sydney Water currently provides stormwater, waste water and portable water services to the existing residential and commercial properties. Our current services will require either relocation, adjustment, protection or upsizing to accommodate this predicted growth.

2. Flood management

The concept development should address in detail both the existing flood risk and anticipated flood management system requirements to service future catchment conditions. This should address any current or potential impacts it may have on the social and economic costs to the community as consequence of flooding.

Project designers should use any existing catchment flood management plan as design context. If there is no existing flood management plan which considers future conditions then project designers must develop a strategy for the broader catchment in consultation with Sydney Water and Council.

3. Flood Mitigation Services

Any works which will increase demand for, reduce availability of or impede provision of flood mitigation services must be agreed to by Sydney Water and Council.

4. Flood Models

Any flood models used should be independently reviewed to verify the suitability of the model assumptions.

5. Stormwater discharge

Any discharges to Sydney Water stormwater systems must meet or exceed Sydney Water's stormwater quality targets.

6. Operations & Maintenance Risk

Access to Sydney Water infrastructure must be maintained throughout construction and subsequent ongoing operations. Sydney Water must be consulted on access requirements throughout works.

7. Heritage

Sydney Water must be consulted early and throughout the project in relation to any works taking place either listed or unlisted heritage assets.

Sydney Water has been and will continue to engagement with the Sydney Metro to discuss designs and any constraint solutions that will need to be consider for the benefit of the project and the community. If you require any further information, please contact me on 02 8849 5207 or e-mail fernando.ortego@sydneywater.com.au.

Yours Sincerely

Fernando Ortega
Account Manager

Case Number: 165996

6 November 2017

TRANSPORT FOR NSW
c/- WARREN SMITH & PARTNERS PTY LTD

FEASIBILITY LETTER

Developer:	**TRANSPORT FOR NSW**
Your reference:	**5694000**
Development:	**521 PACIFIC HWY, Crows Nest being Lot CP SP71539, Lot 1 DP575046, Lot 100 DP747672, Lot 101 DP747672, Lot 2 DP575046, Lot 3 DP655677, Lot 4 DP1096359, Lot A DP442804, Lot A DP374468, Lot B DP374468, Lot CP SP52547**
Development Description:	**Construction of Crows Nest Station Over Site Development for Sydney Metro.**
Your application date:	**29 August 2017**

Dear Applicant

Thank you for providing us with the opportunity work with you on the concept design for the construction of Crows Nest Station Over Site Development as a part of the Sydney Metro. This Feasibility Letter (Letter) is a guide only. It provides general information about what Sydney Water's requirements may be when you apply to us for a Section 73 Certificate (Certificate) for your proposed development. **The information is accurate at today's date only.**

When you obtain development consent for this development we will require you to apply to us for a Section 73 Certificate. You will need to submit a new application (and pay another application fee) to us for that Certificate by using your current or another Water Servicing Coordinator (Coordinator).

Sydney Water will then send you either a:

- Notice of Requirements (Notice) and Developer Works Deed (Deed) or
- Certificate.

These documents will be the definitive statement of Sydney Water's requirements.

There may be changes in Sydney Water's requirements between the issue dates of this Letter and the Notice or Certificate. The changes may be:

- if you change your proposed development eg the development description or the plan/ site layout, after today, the requirements in this Letter could change when you submit your new application; and

- if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

What You Must Do To Get A Section 73 Certificate In The Future.

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting www.sydneywater.com.au > Plumbing, building & developing > Developing > Land development.

1. **Obtain Development Consent from the consent authority for your development proposal.**

2. **Engage a Water Servicing Coordinator (Coordinator).**

   You must engage your current or another authorised Coordinator to manage the design and construction of works that you must provide, at your cost, to service your development. If you wish to engage another Coordinator (at any point in this process) you must write and tell Sydney Water.

   For a list of authorised Coordinators, either visit www.sydneywater.com.au > Plumbing, building & developing > Developing > Providers > Lists or call **13 20 92.**

   The Coordinator will be your point of contact with Sydney Water. They can answer most questions that you might have about the process and developer charges and can give you a quote or information about costs for services/works (including Sydney Water costs).

3. **Developer Works Deed**

   It would appear that your feasibility application is served from existing mains and does not require any works to be constructed at this time. Sydney Water will confirm this with you after you have received Development Approval from Council and your Coordinator has submitted a new Development application and Sydney Water has issued you with a formal Notice of Requirements.

4. **Water and Sewer Works**

   4.1 **Water**

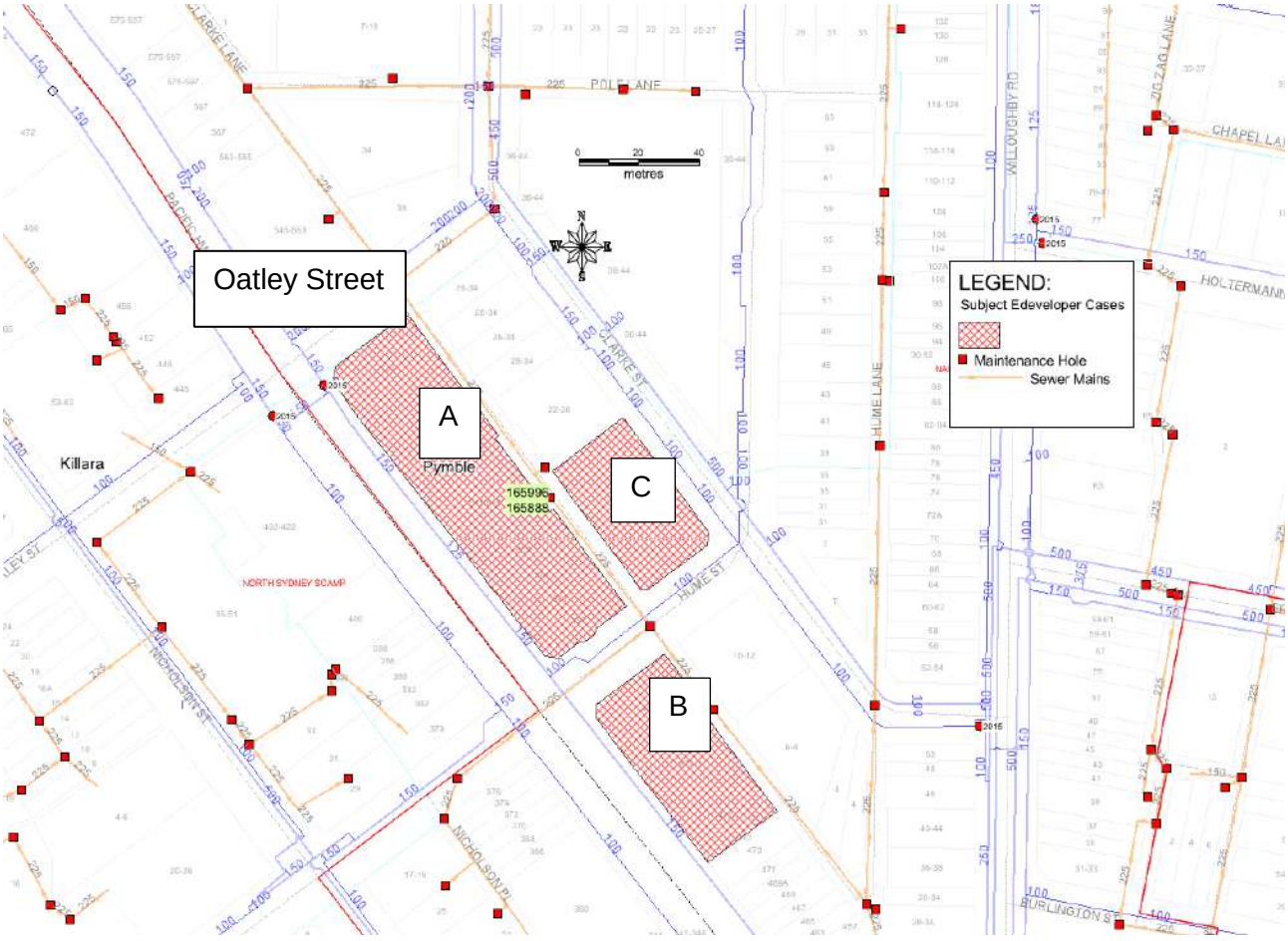
   Your development must have a frontage to a water main that is the right size and can be used for connection.

   Based on the indicated drinking water demand of 275kLs/day and the current network configuration, Sydney Water has assessed your application and found that:

   - Based on the proposed usage figures, amplifications of the local reticulation system will

be required. The location and extent of the amplification will be based on network modelling, once the Section 73 application is received for this development.

- The following mains will provide a point of connection for your development (please also refer to the diagram below):
    - Area A is to be served by the 200mm DICL along Oatley Street
    - Area B is to be served by the 150mm CICL along Pacific Highway
    - Area C is to be served by the 100mm along Clarke Street
- Your development must have its own connection to those water main and a water service and meter.
- Please see the paragraphs below on Multi-level individual metering requirements, Private Water Services Connection and Metering, Large Water Service Connection and Fire Fighting for additional information.



4.2 **Sewer**

Your development must have a sewer main that is the right size and can be used for connection.

Based on the indicated wastewater flow of 223kLs/day and the current network configuration, Sydney Water has assessed your application and found that:

- The existing 225mm VC sewer main in Clarke Lane will serve your development.
- The sewer must also have a connection point outside, but as close as practically possible to the development boundary, behind the kerb and gutter.
- Please note, if you intend to pump your wastewater to Sydney Water's wastewater main, you will be required to lodge an application with Sydney Water's Tap In™.

5. Ancillary Matters

5.1 Asset adjustments

After Sydney Water issues this Notice (and more detailed designs are available), Sydney Water may require that any water main/sewer main/stormwater located in or around your site needs to be adjusted/deviated. If this happens, you will need to do this work as well as the extension we have detailed above at your cost. The work must meet the conditions of this Notice and you will need to complete it **before we can issue the Certificate**. Sydney Water will need to see the completed designs for the work and we will require you to lodge a security. The security will be refunded once the work is completed.

5.2 Entry onto neighbouring property

If you need to enter a neighbouring property, you must have the written permission of the relevant property owners and tenants. You must use Sydney Water's **Permission to Enter** form(s) for this. You can get copies of these forms from your Coordinator or the Sydney Water website. Your Coordinator can also negotiate on your behalf. Please make sure that you address all the items on the form(s) including payment of compensation and whether there are other ways of designing and constructing that could avoid or reduce their impacts. You will be responsible for all costs of mediation involved in resolving any disputes. Please allow enough time for entry issues to be resolved.

6. Multi-level individual metering requirements

Your development must either allow for or provide individual metering. This means that you must:

1. comply at all times and in all respects with the requirements of Sydney Water's "Multi-level Individual Metering Guide" (version 7 dated 28 October 2016);

2. provide and install plumbing and space for individual metering in accordance with Sydney Water's "Multi-level Individual Metering Guide";

3. if and when you implement a strata/ stratum plan (or strata/ stratum subdivide) you must:
    a. engage an Accredited Metering Supplier ("**AMS**") to provide individual metering in accordance with the "Multi-level Individual Metering Guide" and meet the cost of the

meters and metering system;

b. transfer the meters and metering system to Sydney Water once the Testing Certificate has been issued by Sydney Water to the AMS and the AMS has confirmed that payment for the meters and metering system has been paid in full.

Before the Section 73 Certificate can be issued, you must sign the attached undertaking to show that you understand and accept these metering requirements and associated costs.

All the details about this requirement are available on Sydney Water's website at www.sydneywater.com.au.

OTHER THINGS YOU MAY NEED TO DO

Shown below are other things you need to do that are NOT a requirement for the Certificate. They may well be a requirement of Sydney Water in the future because of the impact of your development on our assets. You must read them before you go any further.

Approval of your building plans

Please note that the building plans must be approved when each lot is developed. This can be done at Sydney Water Tap in™. Visit www.sydneywater.com.au > Plumbing, building & developing > Building > Sydney Water Tap in™.

This is not a requirement for the Certificate but the approval is needed because the construction/building works may affect Sydney Water's assets (e.g. water, sewer and stormwater mains).

Where a Sydney Water stormwater channel, pipe or culvert is located within ten (10) metres of your development site it must be referred to Sydney Water for further assessment.

Your Coordinator can tell you about the approval process including:

- Possible requirements;
- Costs; and
- Timeframes.

Note: You must obtain our written approval before you do any work on Sydney Water's systems. Sydney Water will take action to have work stopped on the site if you do not have that approval. We will apply Section 44 of the *Sydney Water Act 1994.*

Soffit Requirements

Please be aware that floor levels must be able to meet Sydney Water's soffit requirements for property connection and drainage.

Private Water Services Connection and Metering

To provide domestic water to the total development you will need to connect to the Sydney

Water main. You must lodge an application for this connection at Sydney Water Tap in™. We will then tell you about any requirements you need to meet. Visit www.sydneywater.com.au > Plumbing, building & developing > Building > Sydney Water Tap in™ to find out more.

Visit www.sydneywater.com.au > Plumbing, building & developing > Plumbing > Meters & metered standpipes to find out more about our metering requirements for your development.

Large Water Service Connection

A water main is available to provide your development with a domestic supply. The size of your development means that you will need a connection larger than the standard domestic 20 mm size.

To get approval for your connection, you will need to lodge an application with Sydney Water Tap in™. You, or your hydraulic consultant, may need to supply the following:

- A plan of the hydraulic layout;
- A list of all the fixtures/fittings within the property;
- A copy of the fireflow pressure inquiry issued by Sydney Water;
- A pump application form (if a pump is required);
- All pump details (if a pump is required).

You will have to pay an application fee.

Sydney Water does not consider whether a water main is adequate for fire fighting purposes for your development. We cannot guarantee that this water supply will meet your Council's fire fighting requirements. The Council and your hydraulic consultant can help.

Fire Fighting

Definition of fire fighting systems is the responsibility of the developer and is not part of the Section 73 process. It is recommended that a consultant should advise the developer regarding the fire fighting flow of the development and the ability of Sydney Water's system to provide that flow in an emergency. Sydney Water's Operating Licence directs that Sydney Water's mains are only required to provide domestic supply at a minimum pressure of 15 m head.

A report supplying modelled pressures called the Statement of Available pressure can be purchased through Sydney Water Tap in™ and may be of some assistance when defining the fire fighting system. The Statement of Available pressure, may advise flow limits that relate to system capacity or diameter of the main and pressure limits according to pressure management initiatives. If mains are required for fire fighting purposes, the mains shall be arranged through the water main extension process and not the Section 73 process.

Disused Water Service Sealing

You must pay to disconnect all disused private water services and seal them at the point of connection to a Sydney Water water main. This work must meet Sydney Water's standards in

the Plumbing Code of Australia (the Code) and be done by a licensed plumber. The licensed plumber must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Disused Sewerage Service Sealing

Please do not forget that you must pay to disconnect all disused private sewerage services and seal them at the point of connection to a Sydney Water sewer main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Trade Wastewater Requirements

If this development is going to generate trade wastewater, the property owner must submit an application requesting permission to discharge trade wastewater to Sydney Water's sewerage system. You must wait for approval of this permit before any business activities can commence.

The permit application should be emailed to Sydney Water's Business Customer Services at businesscustomers@sydneywater.com.au

It is illegal to discharge Trade Wastewater into the Sydney Water sewerage system without permission.

A **Boundary Trap** is required for all developments that discharge trade wastewater where arrestors and special units are installed for trade wastewater pre-treatment.

If the property development is for Industrial operations, the wastewater may discharge into a sewerage area that is subject to wastewater reuse. Find out from Business Customer Services if this is applicable to your development.

Backflow Prevention Requirements

Backflow is when there is unintentional flow of water in the wrong direction from a potentially polluted source into the drinking water supply.

All properties connected to Sydney Water's supply must install a testable **Backflow Prevention Containment Device** appropriate to the property's hazard rating. Property with a high or medium hazard rating must have the backflow prevention containment device tested annually. Properties identified as having a low hazard rating must install a non-testable device, as a minimum.

Separate hydrant and sprinkler fire services on non-residential properties, require the installation of a testable double check detector assembly. The device is to be located at the boundary of the property.

Before you install a backflow prevention device:

1. Get your hydraulic consultant or plumber to check the available water pressure versus the property's required pressure and flow requirements.
2. Conduct a site assessment to confirm the hazard rating of the property and its services. Contact PIAS at NSW Fair Trading on **1300 889 099**.

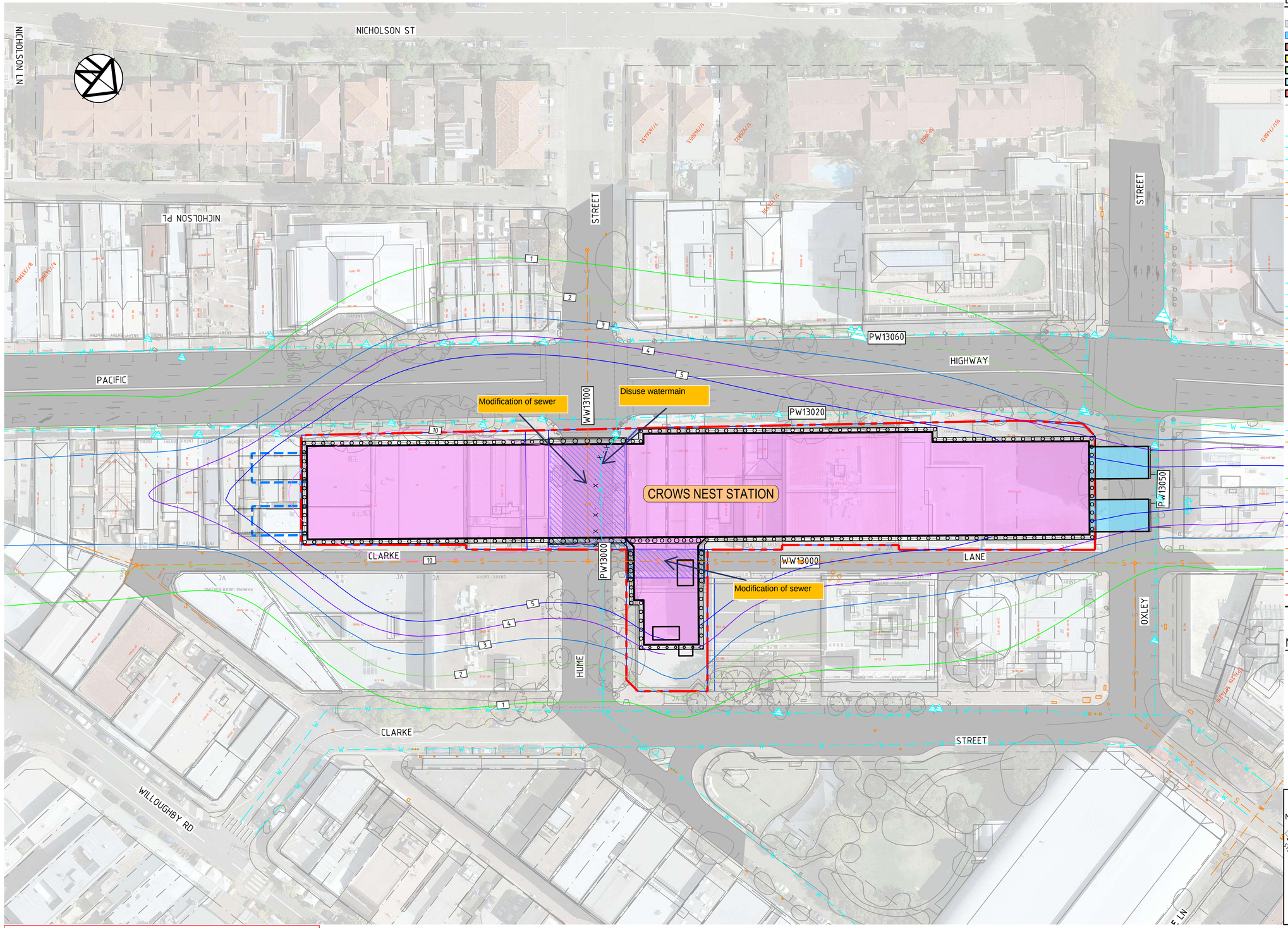
For installation you will need to engage a licensed plumber with backflow accreditation who can be found on the Sydney Water website:
http://www.sydneywater.com.au/Plumbing/BackflowPrevention/

Other fees and requirements
The requirements in this Notice relate to your Certificate application only. Sydney Water may be involved with other aspects of your development and there may be other fees or requirements. These include:

- plumbing and drainage inspection costs;
- the installation of backflow prevention devices;
- trade waste requirements;
- large water connections and
- council fire fighting requirements. (It will help you to know what the fire fighting requirements are for your development as soon as possible. Your hydraulic consultant can help you here.)

No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from Sydney Water and to the extent that it is able, Sydney Water limits its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.

END



DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

LEGEND

GENERAL

- EXISTING ROAD PAVEMENT
- DEMOLITION BOUNDARY
- STATION CAVERN
- CROSSOVER CAVERN
- DIVE STRUCTURES
- NOZZLE ENLARGEMENTS
- STATION ADITS
- CADASTRAL BOUNDARY
- STATION SHAFTS
- STATION EXCAVATIONS
- EASEMENT
- GATE
- FENCE
- DRIVEWAY CROSSOVER

EXISTING UTILITIES

- W (AB) WATER TYPE AB
- W (B) WATER TYPE B
- W (C) WATER TYPE C
- W (D) WATER TYPE D
- S (AB) GRAVITY SEWER TYPE AB
- S (B) GRAVITY SEWER TYPE B
- S (C) GRAVITY SEWER TYPE C
- S (D) GRAVITY SEWER TYPE D

EXISTING UTILITIES TO BE REMOVED

- W (AB) WATER TYPE AB
- W (B) WATER TYPE B
- W (C) WATER TYPE C
- W (D) WATER TYPE D
- S (AB) GRAVITY SEWER TYPE AB
- S (B) GRAVITY SEWER TYPE B
- S (C) GRAVITY SEWER TYPE C
- S (D) GRAVITY SEWER TYPE D

PROPOSED UTILITIES

- W WATER
- S GRAVITY SEWER

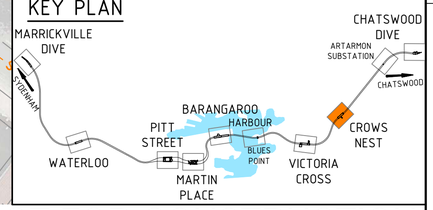
SETTLEMENT CONTOURS

- 1 1mm SETTLEMENT CONTOURS
- 2 2mm SETTLEMENT CONTOURS
- 3 3mm SETTLEMENT CONTOURS
- 4 4mm SETTLEMENT CONTOURS
- 5 5mm SETTLEMENT CONTOURS
- 10 10mm SETTLEMENT CONTOURS
- 15 15mm SETTLEMENT CONTOURS
- 20 20mm SETTLEMENT CONTOURS
- 25 25mm SETTLEMENT CONTOURS
- 30 30mm SETTLEMENT CONTOURS
- 40 40mm SETTLEMENT CONTOURS
- 50 50mm SETTLEMENT CONTOURS

NOTES

1. UTILITY INFORMATION SHOWN ON THESE DRAWINGS HAS BEEN OBTAINED BY DIAL BEFORE YOU DIG (DBYD) ENQUIRIES, PROVIDED BY TFNSW GIS POTAL AND SOURCED DIRECTLY FORM AUTHORITIES IN CAD/GIS/PDF AND WORK AS EXECUTED (WAE) DRAWINGS. ACCURACY HAS NOT BEEN CONFIRMED.
2. ALL UTILITY INFORMATION IS TO BE CLASSIFIED AS QUALITY LEVEL D (QL-D) AS PER AUSTRALIAN STANDARD AS5488-2013. NO HORIZONTAL TOLERANCE APPILES TO THE LINE LOCATIONS.
3. DESIGN CHANGES AT VICTORIA CROSS STATION HAVE RESULTED IN EXISTING SETTLEMENT CONTOURS TO BE INVALID. INFORMATION WILL BE ISSUED TO SYDNEY WATER WHEN IT HAS BECOME AVAILABLE.

KEY PLAN



NOT FOR CONSTRUCTION

	REVISION IN PROGRESS			
A	-	0	0	0
AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE

CO-ORDINATE SYSTEM: MGA | HEIGHT DATUM: AHD | SCALE: 1:500

SCALES
0 5 10 15 20 25 30m
SCALE 1:500 AT A1 SIZE

IC CERTIFIED - IC CERTIFICATE

CLIENT
NSW GOVERNMENT Transport for NSW

CHECK PRINT PRELIM ☐ FINAL ☐	INITIAL	DATE
ENGINEER CHECK		
DRAFTING CHECK		
BACKDRAFTED/CORRECTED		
CONFIRMED/VERIFIED		

DRAWN	M. ZDUNEK	XX.XX.XX
DESIGNED	B. JACKSON	XX.XX.XX
DRG CHECK	J. MACADANGDANG	XX.XX.XX
DESIGN CHECK	T. THEIVENDRAN	XX.XX.XX
APPROVED	D. ROBERTSON	XX.XX.XX

SYDNEY METRO CITY & SOUTHWEST

CROWS NEST STATION AND PRECINCT
CIVIL WORKS (STATIONS & SURROUNDS)
SETTLEMENT CONTOURS
WATER AND SEWER UTILITIES PLAN

FILE No.	SHEET: 1 OF 1	A1
STATUS: DEVELOPED CONCEPT DESIGN		©
DRG No. SMCSWTSE-JAB-SCN-UT-SKE-648501	A	EDMS No.

DF 801*554

File Plotted:C:\SMCSW-TSE-Export\
Plot Date & Time:8/18/2017 3:24 PM
Plotted by:FRANZ.BATHAN

Case Number: 166589

20 December 2017

ROSE ATKINS RIMMER

Dear Sir/Madam

Property: **Hume Street, Crows Nest**
Your Reference: **91/24609**
Plan Identification Number: 166589WW

This letter details job specific information for you to deliver the Sydney Water deviation works in conjunction with your project. Additional information about construction and fees are also included in this document. Your Water Servicing Coordinator (WSC) will be able to provide more information about the requirements/process.

After you tell us who the approved Constructor is, lodge both the completed ITP and executed Deed Poll with Sydney Water, we will review them and then release your ITP. This will complete your Design Package and enable you to start construction.

Please note, you must disconnect all disused private sewerage services and seal them at the point of connection to a Sydney Water sewer main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this. **To get approval for your disconnection, you will need to lodge an application at Sydney Water Tap in™.**

1. **Job Specific Information**

Attached is the Waste Water Design Package for the location of works shown above. This package was received by Sydney Water and dated 19 December 2017/Version No. 5.

Note (i) Construction Commencement

You must send your Construction Commencement Notice to Sydney Water's SWConnect as set down in the Instructions to Water Servicing Coordinators (Major Works).

2. General Information

The Asset Adjustment and Protection Manual is available on our website as a guide to the Process and Procedures for completing the adjustment works. The manual also provides links to the provider instructions and our policies for your reference.

Link:http://www.sydneywater.com.au/SW/plumbing-building-developing/building/building-over-or-next-to-assets/DD_065164

2.1 Construction

While connections to existing Sydney Water assets are generally at the end of construction, the constructor, in conjunction with the WSC, must review the design prior to commencement of works and identify all connections to Sydney Water's existing assets. All connections at any stage of construction must only proceed after obtaining the appropriate approval from Sydney Water.

- Before connection, the Generic Asset Hazards (detailed in Instructions to Water Servicing Coordinators (Major Works) must be addressed in your Safe Work Plan and Environmental Management Plan.

  The Generic Asset Hazards/Conditions - At the Point of Connection, listed in the Provider Instructions, must be addressed in your Safe Work Plan and Environmental Management Plan.

  Notes:

  - There are work environment hazards that include (but are not limited to) traffic and the closeness of other utility services;
  - All developers, constructors and individuals have an OH&S obligation and a duty of care when working near underground plant; and
  - Any person who destroys, damages or interferes with any Sydney Water asset is liable to compensate Sydney Water.

- Extra hold points might be included in the ITP by Sydney Water when you lodge the Construction Commencement Notice (CCN).

2.2 Fees

- **Operational Costs**

  Operational costs include providing customer notifications, site inspections, audits, shutdowns, chlorination of water mains and connections at an hourly rate of $149.31 (including $13.57 GST) per hour per person.

- **Contract Administration Costs**

  This fee will be invoiced to your company at the current hourly rate of $149.31 (including $13.57 GST. It is for time spent during the design, construction, connection and finalisation phases of this work.

- At the finalisation of these works, the Developer will need to pay any outstanding Contract Administration and Operational charges directly to Sydney Water.

  Notes:

- The Tax Invoice must be paid to Sydney Water within 30 days of being issued.

- You should tell your developer/applicant client of these Sydney Water costs before proceeding with this work.

END

Case Number: 166589

14 November 2017

TRANSPORT FOR NSW
c/- ROSE ATKINS RIMMER

LETTER of REQUIREMENTS (to commence Design Process)
ADJUSTMENT OF A SYDNEY WATER ASSET

Applicant: **TRANSPORT FOR NSW**
Your reference: **91/24609**
Property location: **Hume Street, Crows Nest**
Your application date: **11 October 2017**

Dear Applicant,

Sydney Water has received your application and the concept design to undertake work at the above location. If you do not submit your design by 14 November 2018 this advice will need to be reviewed.

The proposal has been reviewed and you are required to do the following things:

- Undertake investigation as part of the design process to determine the full extent of any adjustments based on your final works design.

- The two 225mm VC wastewater mains in Hume Street and Clarke Lane are required to be deviated to cater for the proposed development. Hydraulic grade and pipe size is to be maintained.

- The 100mm CICL water main in Hume Street is to be disused and removed to cater for your proposed development. You must ensure that any existing connections (if any) to the decommissioned main, that are still required, must be transferred to another main fronting the property that requires connection.

- You must not start work on the existing sewer main or the proposed adjustment until Sydney Water advises your Coordinator. This includes the placement of any temporary pipework. Before you can do this pipework, you must engage your Coordinator to lodge an application that must include appropriate temporary pipework detail as well as the design of the proposed deviation/adjustment/extension. Sydney Water will then assess both designs and advise your Coordinator when they are approved and of any conditions to be met before pipe placement.

- If any work on our assets is carried out without that advice or final approval, Sydney Water will take action to have work on the site stopped. We will apply the provisions of Section 45 of the Sydney Water Act 1994.

- You must disconnect all disused private sewerage services and seal them at the point of connection to a Sydney Water sewer main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this. To get approval for your disconnection, you will need to lodge an application at Sydney Water Tap in™.

- You must disconnect all disused private water services and seal them at the point of connection to a Sydney Water water main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed plumber. The licensed plumber must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this. To get approval for your disconnection, you will need to lodge an application at Sydney Water Tap in™.

- A water main is available to provide your development with a domestic supply. The size of your development means that you will need a connection larger than the standard domestic 20 mm size. To get approval for your connection, you will need to lodge an application at Sydney Water Tap in™. You will have to pay an application fee.

  You, or your hydraulic consultant, may need to supply the following:
  - A plan of the hydraulic layout;
  - A list of all the fixtures/fittings within the property;
  - A copy of the fireflow pressure inquiry issued by Sydney Water;
  - A pump application form (if a pump is required);
  - All pump details (if a pump is required).

  We will then tell you about any requirements you need to meet. Visit www.sydneywater.com.au > Plumbing, building & developing > Building > Sydney Water Tap inTM to find out more. Visit www.sydneywater.com.au > Plumbing, building & developing > Plumbing > Meters & metered standpipes to find out more about our metering requirements for your development

- Sydney Water does not consider whether the existing water main(s) is adequate for fire fighting purposes for your site. We cannot guarantee that this water supply will meet your fire fighting requirements. Your hydraulic consultant can help.

- Trade Wastewater Requirements

  If this development is going to generate trade wastewater, the property owner must submit an application requesting permission to discharge trade wastewater to Sydney Water's sewerage system. You must wait for approval of this permit before you can commence discharging.

The permit application should be emailed to Sydney Water's Business Customer Services at businesscustomers@sydneywater.com.au

It is illegal to discharge Trade Wastewater into the Sydney Water sewerage system without permission.

A **Boundary Trap** is required for all developments that discharge trade wastewater where arrestors and special units are installed for trade wastewater pre-treatment.

If the property development is for Industrial operations, the wastewater may discharge into a sewerage area that is subject to wastewater reuse. Find out from Business Customer Services if this is applicable to your development.

The asset adjustment and protection manual will detail and assist you in your review and the process that is required to be followed to complete all works. The manual can be found on the following link: www.sydneywater.com.au/SW/SearchResults/index.htm?ssUserText=asset+aDJUSTMENT+And+protection+manual

The Water Servicing Coordinator generally will be the single point of contact between you and Sydney Water. They can answer most questions you might have about our process and charges.

Consideration of the following minimum activities, listed in the manual, should also be undertaken:

1. Design Package: A design package prepared by an approved designer must be lodged with Sydney Water, based on the relevant codes, standards and any requirement by Sydney Water. The designer prepares this design for the Water Servicing Coordinator to submit to Sydney Water together with any supporting documents and forms they need to support the design. Supporting documentation is listed in the manual.

   We will work with the designer to determine the best result for all parties, as during the design phase the adjustment of our services may affect your project design and vice versa. Once we complete the review, we will send the coordinator a Job Specific Schedule letter telling them this.

2. Permission to Enter: If you need to enter a neighbouring property, you must have the written permission of the relevant property owners and tenants. You must use Sydney Water's **Permission to Enter** form(s) for this. You can get copies of these forms from your Water Servicing Coordinator. Your Coordinator can also negotiate on your behalf. You will be responsible for all costs of mediation involved in resolving any disputes. Please allow enough time for entry issues to be resolved.

3. Construction Costs: Construction of the determined works will require you to pay project management, survey, design and construction costs directly to your Providers. Additional costs payable to Sydney Water may include:

   - water main shutdown and disinfection;
   - connection of new water mains to Sydney Water system(s);
   - design and construction audit/inspection fees;
   - contract administration, Operations Area Charge & Customer Redress prior to project finalisation;

- creation or alteration of easements including any compensation that may applicable;
- water usage charges where water has been supplied for building activity purposes prior to disinfection of a newly constructed water main.

Note: Payment for any Goods and Services (including Customer Redress) provided by Sydney Water will be required prior to the release of the Bank Guarantee or Cash Bond.

Your Coordinator can tell you about these costs.

4. Variations: Any variation submitted to Sydney Water for approval during the design and/ or construction stages of the works must include the associated cost and details of the variation. Sydney Water will review the variation and advise of the outcome.

If any work on our assets is carried out without final Sydney Water approval, Sydney Water will take action to have work on the site stopped. We will apply the provisions of Section 45 of the Sydney Water Act 1994.

END

Case Number: 166589

4 December 2017

ROSE ATKINS RIMMER

Dear Sir/Madam

Project : **Sydney Metro City and Southwest**
Project Location: **Hume Street, Crows Nest**
Your Reference: **91/24609**
Plan Identification Number: 166589PW

This letter details job specific information for you to deliver the Sydney Water adjustment works in conjunction with your project. Additional information about construction and fees are also included in this document. Your Water Servicing Coordinator (WSC) will be able to provide more information about the requirements/process.

After you tell us who the approved Constructor is, lodge both the completed ITP and executed Deed Poll with Sydney Water, we will review them and then release your ITP. This will complete your Design Package and enable you to start construction. Before Sydney Water will release your ITP you will need to do the following:

- **Update the Sheet Number to specify the total number of sheets in the design and submit as a variation to Sydney Water.**

Please note, you must disconnect all disused private sewerage services and seal them at the point of connection to a Sydney Water sewer main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this. **To get approval for your disconnection, you will need to lodge an application at Sydney Water Tap in™.**

1. Job Specific Information

The Potable Water Design plan dated 23 November 2017 / Version No. 3 has been released for tendering purposes.

After you have engaged a Constructor and the following matters have been addressed, this plan can be used for construction. If there are any changes after tendering, you must give us the appropriate Project Variation documents.

(a) After you tell us who the approved Constructor is to deliver the Sydney Water works,

lodge both the completed Inspection Test Plan (ITP) and the attached executed Deed Poll with Sydney Water

(b) Complete the Construction Commencement Notice (CCN), and send to Sydney Water for notification (See note i)

Note (i) Construction Commencement

You must send your Construction Commencement Notice to Sydney Water's SWConnect as set down in the Instructions to Water Servicing Coordinators (Major Works).

2. General Information

The Asset Adjustment and Protection Manual is available on our website as a guide to the Process and Procedures for completing the adjustment works. The manual also provides links to the provider instructions and our policies for your reference.

Link:http://www.sydneywater.com.au/SW/plumbing-building-developing/building/building-over-or-next-to-assets/DD_065164

2.1 Construction

While connections to existing Sydney Water assets are generally at the end of construction, the constructor, in conjunction with the WSC, must review the design prior to commencement of works and identify all connections to Sydney Water's existing assets. All connections at any stage of construction must only proceed after obtaining the appropriate approval from Sydney Water.

- Before connection, the Generic Asset Hazards (detailed in Instructions to Water Servicing Coordinators (Major Works) must be addressed in your Safe Work Plan and Environmental Management Plan.

  The Generic Asset Hazards/Conditions - At the Point of Connection, listed in the Provider Instructions, must be addressed in your Safe Work Plan and Environmental Management Plan.

  Notes:

  - There are work environment hazards that include (but are not limited to) traffic and the closeness of other utility services;
  - All developers, constructors and individuals have an OH&S obligation and a duty of care when working near underground plant; and
  - Any person who destroys, damages or interferes with any Sydney Water asset is liable to compensate Sydney Water.

- Extra hold points might be included in the ITP by Sydney Water when you lodge the Construction Commencement Notice (CCN).
  2.2 Fees

- **Operational Costs**

Operational costs include providing customer notifications, site inspections, audits, shutdowns, chlorination of water mains and connections at a hourly rate of $149.31 (including $13.57 GST) per hour per person.

- **Contract Administration Costs**

This fee will be invoiced to your company at the current hourly rate of $149.31 (including $13.57 GST. It is for time spent during the design, construction, connection and finalisation phases of this work.

- At the finalisation of these works, the Developer will need to pay any outstanding Contract Administration and Operational charges directly to Sydney Water.

Notes:

- The Tax Invoice must be paid to Sydney Water within 30 days of being issued.
- You should tell your developer/applicant client of these Sydney Water costs before proceeding with this work.

END

Developer Works Deed

Schedule 3: Deed Poll

Case number: 166589

Site: Hume Street, Crows Nest

Type of works:

- ☐ **Drinking water**
- ☐ **Recycled water**
- ☐ **Wastewater – major**
- ☐ **Stormwater**

(Applicant WSC reference: 91/24609)

Contents

About this Deed Poll

Developer Works

Case number:	166589
Site:	Hume Street, Crows Nest

Execution dates

Developer Works Deed:	17 November 2017
Deed Poll:	

Parties

Sydney Water:	Sydney Water Corporation	**ABN:**	49 776 225 038
Developer:	TRANSPORT FOR NSW	**ABN:**	
WSC:	ROSE ATKINS RIMMER	**ABN:**	
Designer:		**ABN:**	
Constructor:		**ABN:**	

Agreement

(a) Apart from _____, the parties listed here entered into the Developer Works Deed for the Developer Works on the date noted above.

(b) The Developer has now appointed _____.

(c) Once this Deed Poll is executed, _____ will:

(i) assume all its obligations under the Developer Works Deed

(ii) submit to all the terms of the Developer Works Deed.

(d) All parties to the Developer Works Deed enter into this Deed Poll and can rely upon it.

Executing this Deed Poll

CONSTRUCTOR OR REPLACEMENT PROVIDER

Company with more than one director or secretary

EXECUTED by

Name of director	Signature of director

Name of secretary	Signature of secretary

Company with a sole director and company secretary

EXECUTED by:

Name of sole director and company secretary	Signature of sole director and company secretary

Party executing under power of attorney

SIGNED for under power of attorney:

Name of attorney (who warrants authorisation to enter into this agreement)	Signature of attorney	Date of power of attorney

In the presence of:

Name of witness	Signature of witness

Party executing under delegated authority

SIGNED for under delegated authority:

Name of delegated person (who warrants authorisation to enter into this agreement)	Signature of delegated person	Position of delegated person	Date delegated authority commenced

In the presence of:

Name of witness	Signature of witness

Partner to an unincorporated partnership

EXECUTED by on behalf of:

Name of partner	Signature of partner
In the presence of:	
Name of witness	Signature of witness

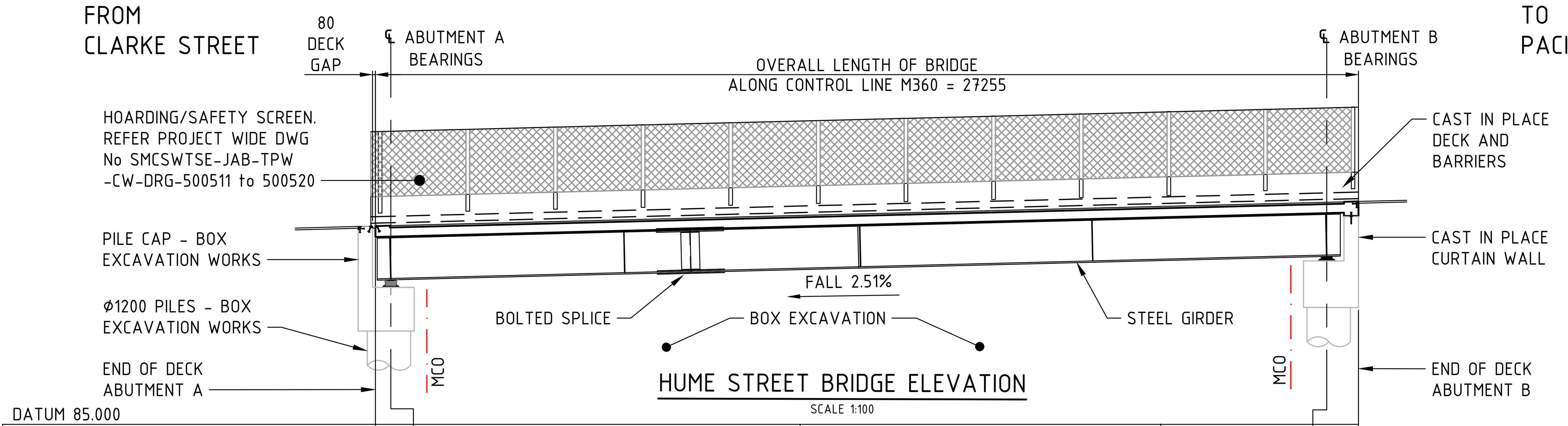
Sole trader/individual

SIGNED by:

Name of party	Signature of party
In the presence of:	
Name of witness	Signature of witness

Appendix C

North Sydney Council Information

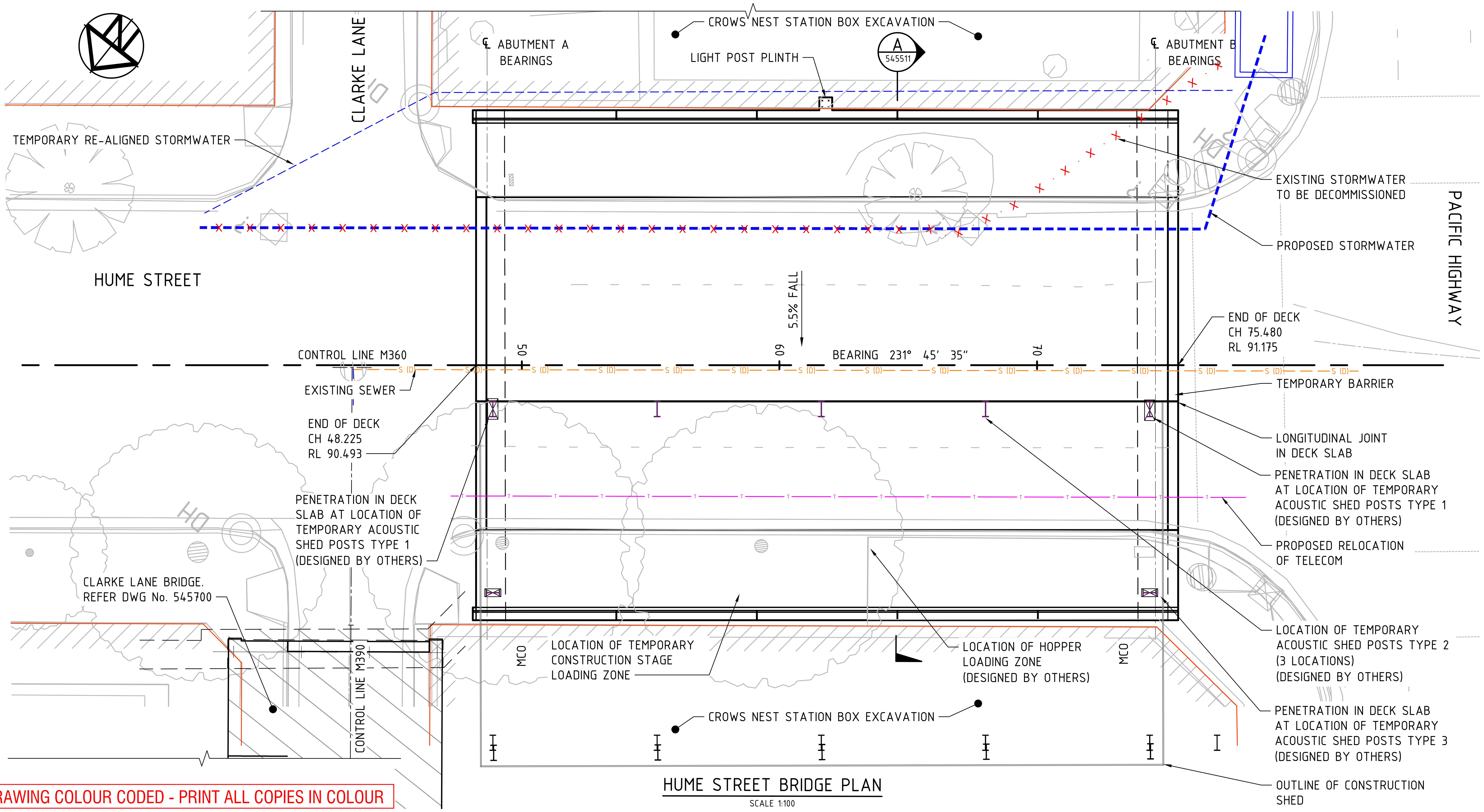


HUME STREET BRIDGE ELEVATION

SCALE 1:100

DATUM 85.000

PROPOSED DESIGN SURFACE LEVEL ALONG CONTROL LINE M360	90.493	90.503	90.787	91.038	91.153	91.175
APPROXIMATE EXISTING SURFACE LEVEL ALONG CONTROL LINE M360	90.61	90.62	90.85	91.09	91.22	91.23
CHAINAGE ALONG CONTROL LINE M360	48.225	48.650	60.000	70.000	74.600	75.480



HUME STREET BRIDGE PLAN

SCALE 1:100

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NOTES

GENERAL

1. FOR PROJECT WIDE GENERAL NOTES REFER TO DRAWINGS SMCSWTSE-JAB-TPW-EX-DRG-500010 AND 500014.
2. FOR PROJECT WIDE STANDARD DETAILS REFER TO DRAWINGS SMCSWTSE-JAB-TPW-EX-DRG-500020 TO 500150.
3. DIMENSIONS ARE IN MILLIMETRES.
4. CHAINAGES, SET-OUT AND REDUCED LEVELS ARE IN METRES.
5. REDUCED LEVELS ARE RELATIVE TO AUSTRALIAN HEIGHT DATUM.
6. FOR BOX EXCAVATION AND ASSOCIATED WORKS REFER TO DRAWINGS SMCSWTSE-JAB-SCN-EX-DRG-545001 TO 545061.
7. FOR CONSTRUCTION SEQUENCE REFER TO DRAWING No. 545515.

DESIGN SUMMARY NOTES

DESIGN STANDARD — AS5100-2017

TRAFFIC LOADING
DESIGN TRAFFIC LOADING: T44
AADT 6800
No. OF DESIGN LANES: 4
DESIGN TRAFFIC SPEED: 50km/h
TRAFFIC BARRIER PERFORMANCE LEVEL: REGULAR
FATIGUE LOADING CALCULATION IN ACCORDANCE WITH AS 5100.6 SECTION 13.

PEDESTRIAN LOADING — 5kPa

WIND LOADING
WIND TERRAIN CATEGORY: TC3
WIND REGION: A2
REGIONAL WIND SPEED SLS: 37m/s
REGIONAL WIND SPEED ULS: 48m/s
AVERAGE RECURRENCE INTERVAL ULS: R = 200 YEARS
AVERAGE RECURRENCE INTERVAL SLS: R = 20 YEARS
WIND LOADING CALCULATION IN ACCORDANCE WITH AS 5100.2 SECTION 17.

EARTHQUAKE LOADING (AS 5100.2)
BRIDGE EARTHQUAKE DESIGN CATEGORY: BEDC-1

ABUTMENT MOVEMENT
DESIGN ALLOWS FOR THE FOLLOWING INCREMENTAL MOVEMENT ACTING TOWARDS THE MIDSPAN OF THE BRIDGE
ABUTMENT A PILE WALL 23mm
ABUTMENT B PILE WALL 11mm

TEMPORARY CONSTRUCTION LOADING
DESIGN TRAFFIC LOADING T44
No DESIGN LANES OPEN TO PUBLIC 2
No DESIGN LANES WITHIN ZONE 1
ACOUSTIC SHED POSTS TYPE 1 1430/-280kN VERT ±400kN HORIZ
ACOUSTIC SHED POSTS TYPE 2 0 kN VERT ±60kN HORIZ
ACOUSTIC SHED POSTS TYPE 3 280/-250kN VERT ±130kN HORIZ
OTHER LIVE LOAD WITHIN ACOUSTIC SHED 5kPa

LOADING DURING HOPPER OPERATION
PUBLIC DESIGN TRAFFIC LOADING T44
No DESIGN LANES OPEN TO PUBLIC 2
CONSTRUCTION ZONE DESIGN TRAFFIC LOADING ST42.5
No DESIGN LANES WITHIN CONSTRUCTION ZONE 1
OTHER LIVE LOAD WITHIN ACOUSTIC SHED 5kPa
VEHICLE LOADING (ST42.5) DURING HOPPER DUMPING OPERATION BASED ON MAX HOPPER CAPACITY MASS OF 12000kg, 3000mm DROP HEIGHT AND 75mm DECELERATION LENGTH.

FOR CONSTRUCTION

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
00	ASSURED FOR CONSTRUCTION	DT / 07.02.18	MI / 07.02.18	GR / 07.02.18

CO-ORDINATE SYSTEM: MGA | HEIGHT DATUM: AHD | SCALE: 1:100

SCALES: 0 1 2 3 4 5 6m — SCALE 1:100 AT A1 SIZE

IC CERTIFIED - IC CERTIFICATE SMCSWTSE-IC-CER-B2-021-A

CLIENT: NSW GOVERNMENT — Transport for NSW

SERVICE PROVIDERS: ARCADIS, HOCHTIEF, PSM, McMILLEN JACOBS ASSOCIATES, NOMA CONSULTING

DRAWN	J.HUSSEIN	07.02.18
DESIGNED	D.THOMY	07.02.18
DRG CHECK	R.SAFARIAN	07.02.18
DESIGN CHECK	M.ING	07.02.18
APPROVED	G.RIORDAN	07.02.18

SYDNEY METRO CITY & SOUTHWEST
CROWS NEST STATION AND PRECINCT
TEMPORARY WORKS - HUME STREET BRIDGE
GENERAL ARRANGEMENT
SHEET 1

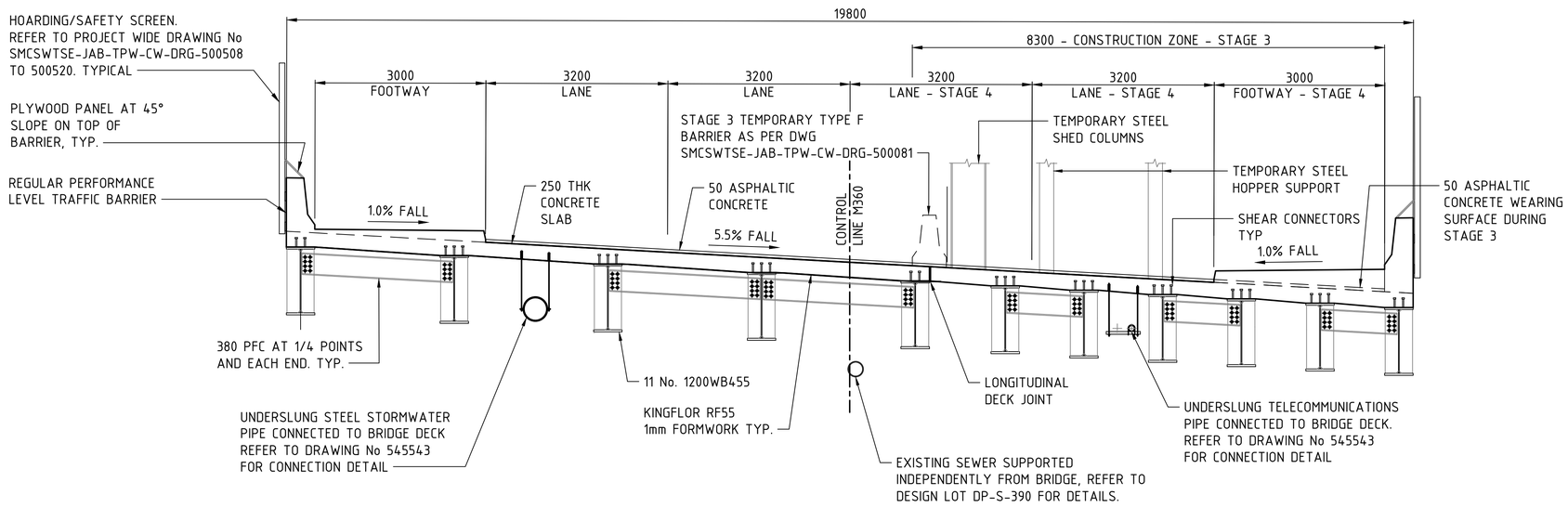
FILE No. | SHEET: 3 OF 30 | A1
STATUS: FOR CONSTRUCTION
DRG No. SMCSWTSE-JAB-SCN-TW-DRG-545510 | 00 | EDMS No.

File Plotted C:\SMCSW-TSE-Export\ Plot Date & Time 2/7/2018 10:25 AM Plotted by RONY.SAFARIAN

DF 801*SS4

COUNTRY

CITY



SECTION A
SCALE 1:50
545510

NOTE

1. FOR OTHER NOTES RELATING TO THIS DRAWING, REFER TO DRAWING No. 545510.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

FOR CONSTRUCTION

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
00	ASSURED FOR CONSTRUCTION	DT / 07.02.18	MI / 07.02.18	GR / 07.02.18

CO-ORDINATE SYSTEM: MGA | HEIGHT DATUM: AHD | SCALE: 1:50

SCALES
0 0.5 1.0 1.5 2.0 2.5 3.0m
SCALE 1:50 AT A1 SIZE

IC CERTIFIED - IC CERTIFICATE SMCSWTSE-IC-CER-B2-021-A

CLIENT
NSW GOVERNMENT Transport for NSW

SERVICE PROVIDERS

DRAWN	J.HUSSEIN	07.02.18
DESIGNED	D.THOMY	07.02.18
DRG CHECK	R.SAFARIAN	07.02.18
DESIGN CHECK	M.ING	07.02.18
APPROVED	G.RIORDAN	07.02.18

SYDNEY METRO CITY & SOUTHWEST

CROWS NEST STATION AND PRECINCT

TEMPORARY WORKS - HUME STREET BRIDGE GENERAL ARRANGEMENT

SHEET 2

FILE No. | SHEET: 4 OF 30 | A1

STATUS: FOR CONSTRUCTION ©

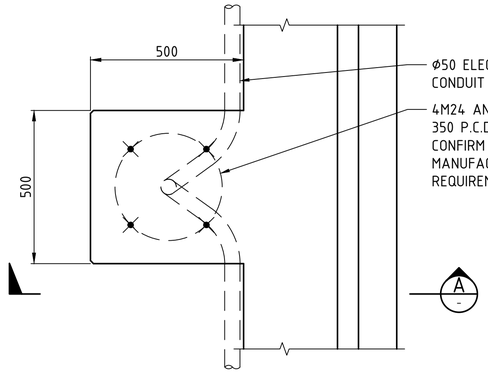
DRG No. SMCSWTSE-JAB-SCN-TW-DRG-545511 | 00 | EDMS No.

DF 801*554

File Plotted C:\SMCSW-TSE-Export\

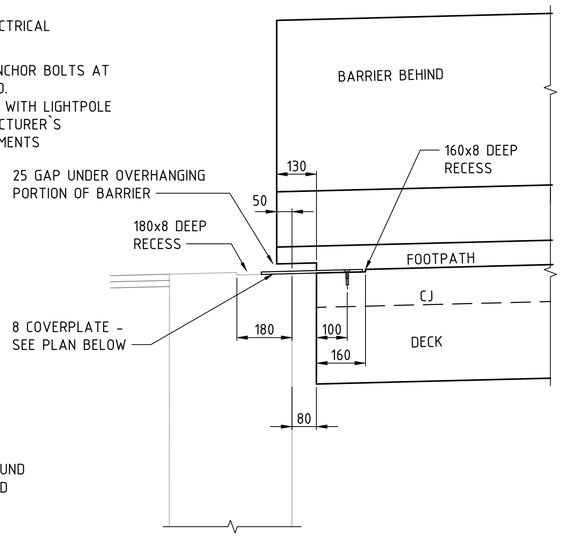
Plot Date & Time 2/7/2018 10:26 AM

Plotted by RONY.SAFARIAN



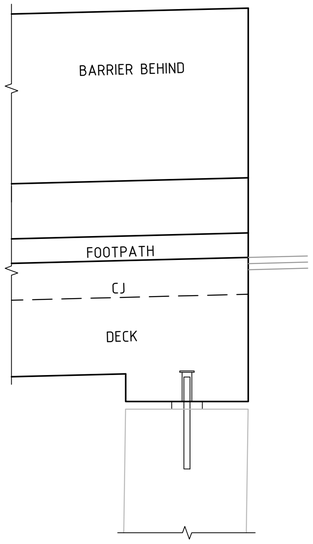
PLAN - LIGHTPOLE PLINTH

SCALE 1:10



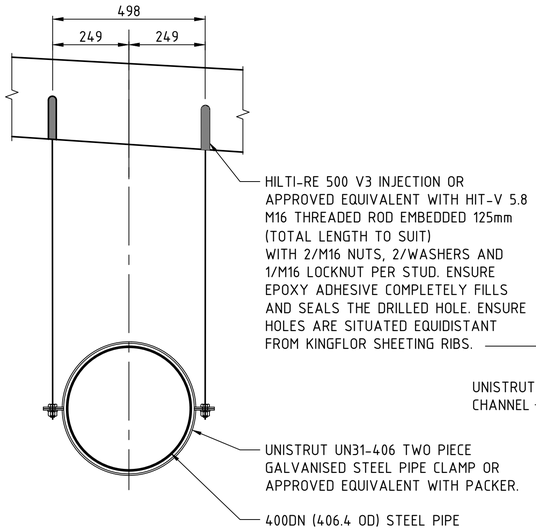
SECTION D 545540

SCALE 1:10



SECTION E 545540

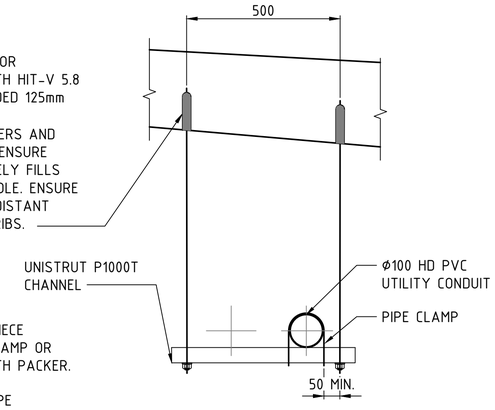
SCALE 1:10



STORMWATER HANGING DETAIL

SCALE 1:10

NOTE: PROVIDE AT MAXIMUM 2m CTS



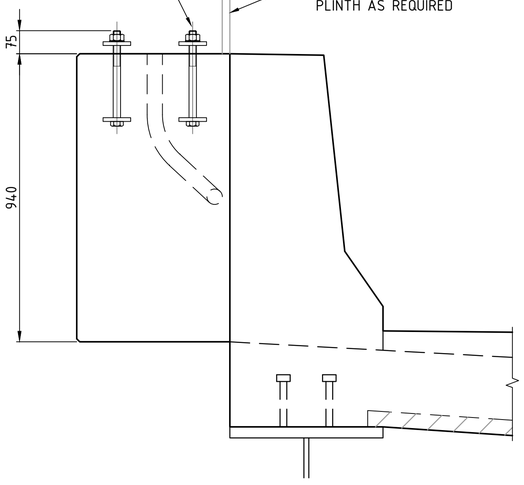
CONDUIT HANGING DETAIL

SCALE 1:10

NOTE: PROVIDE AT MAXIMUM 2m CTS

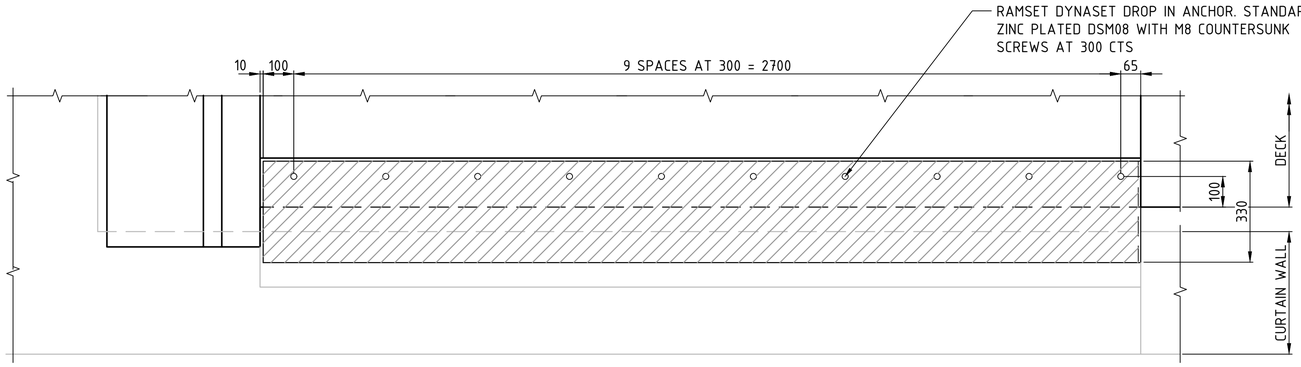
REFER DESIGN LOT DP-S-380 FOR LIGHTING BASE PLATE, POST AND CONDUIT DETAILS.

CUT HOARDING AROUND PLINTH AS REQUIRED



SECTION A -

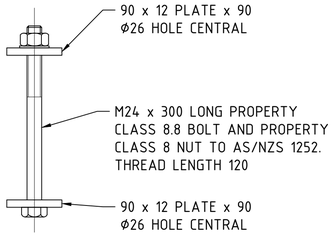
SCALE 1:10



PLAN - COVER PLATE

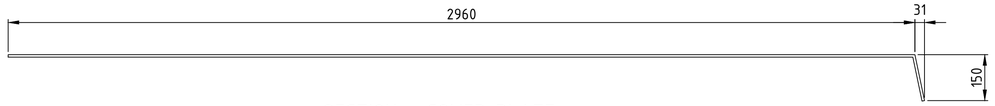
SCALE 1:10

8 THICK COVERPLATE HOT DIP GALVANIZED



LIGHTPOLE ANCHOR BOLT ASSEMBLY

SCALE 1:5



SECTION - COVER PLATE

SCALE 1:10

NOTE

1. FOR OTHER NOTES RELATING TO THIS DRAWING, REFER TO DRAWING No. 545540.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

FOR CONSTRUCTION

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
00	ASSURED FOR CONSTRUCTION	DT / 07.02.18	MI / 07.02.18	GR / 07.02.18

CO-ORDINATE SYSTEM: MGA | HEIGHT DATUM: AHD | SCALE: 1:5, 1:10

SCALES

0 100 200 300 400 500 600mm

SCALE 1:10 AT A1 SIZE

0 50 100 150 200 250 300mm

SCALE 1:5 AT A1 SIZE

IC CERTIFIED - IC CERTIFICATE SMCSWTSE-IC-CER-B2-021-A

CLIENT

NSW GOVERNMENT Transport for NSW

SERVICE PROVIDERS: Metro city & southwest; ARCADIS; BG&E; NOMA CONSULTING; HOCHTIEF ENGINEERING; PSM; McMILLEN JACOBS ASSOCIATES

DRAWN	J.HUSSEIN	07.02.18
DESIGNED	D.THOMY	07.02.18
DRG CHECK	R.SAFARIAN	07.02.18
DESIGN CHECK	M.ING	07.02.18
APPROVED	G.RIORDAN	07.02.18

SYDNEY METRO CITY & SOUTHWEST

CROWS NEST STATION AND PRECINCT

TEMPORARY WORKS - HUME STREET BRIDGE DECK CONCRETE

SHEET 4

FILE No.	SHEET: 14 OF 30	A1
STATUS: FOR CONSTRUCTION		©
DRG No. SMCSWTSE-JAB-SCN-TW-DRG-545543	00	EDMS No.

DF 801*554

File Plotted C:\SMCSW-TSE-Export\

Plot Date & Time 2/7/2018 10:28 AM

Plotted by RONY.SAFARIAN

B.1- North Sydney Council Requirements

From: Zarko Cvetkovic [mailto:Zarko.Cvetkovic@northsydney.nsw.gov.au]
Sent: Wednesday, 24 May 2017 8:47 AM
To: Greg Ives Greg.Ives@metronsydney.com

Subject: RE: On-Site Detention Enq.

Greg,

Generally speaking, in both areas, we normally ask for introduction of OSD systems for major site redevelopments (does not apply for building refurbishments), even though the sites are fully impervious in pre-development stage. The reason is that we want to reduce the stormwater runoff because the most of our stormwater infrastructure is under capacity in those areas, and it is not possible to amplify the system due to numerous physical constraints.

If OSD is required, then requirement is that the maximum discharge from the site does not exceed discharge which would occur during a 1 in 5 year storm for the time of concentration determined for the particular site, for the existing site conditions. All other stormwater run-off from the site for all storms up to the 1 in 100 year storm is to be retained on the site for gradual release to the kerb and gutter or drainage system as required by Director of Assets and Infrastructure Services.

However, I am guessing that the nature of your projects will be predominantly underground and I wouldn't say that OSD requirement will apply in that case.

Regards,

Zarko Cvetkovic
Senior Development Engineer

P 9936 8100
E council@northsydney.nsw.gov.au

www.northsydney.nsw.gov.au

From: Greg Ives [mailto:Greg.Ives@metronsydney.com]
Sent: Tuesday, 23 May 2017 4:26 PM
To: Zarko Cvetkovic <Zarko.Cvetkovic@northsydney.nsw.gov.au>
Cc: Arabnejad, Akram <Akram.Nejad@mottmac.com>
Subject: RE: On-Site Detention Enq.

Zarko,

Thank you for your email.

The two sites in question are:

Crows Nest Between Pacific Highway, Oxley Street, Clark Lane and approx. 60 metres south of Hume Street

North Sydney Miller Street from Berry Street to the MLC building extending through to Dension Street for the extent of the existing Tower Square development

If you believe it would be helpful we could meet in your office at a suitable time.

Many thanks

Greg Ives

0419 244 292

From: Zarko Cvetkovic [mailto:Zarko.Cvetkovic@northsydney.nsw.gov.au]
Sent: Tuesday, 23 May 2017 2:45 PM
To: Greg Ives <Greg.Ives@metronsydney.com>
Subject: Re: On-Site Detention Enq.

Dear Greg,

I was asked by Jim Moore to contact you and provide you with information on OSD requirements for North Sydney Council areas.

I am happy to provide you with all our requirements for OSD (if they apply at all in your case), but I would need to know more about on what are you proposing to develop, and where exactly?

Please, feel free to contact me and provide me with all necessary information, so I will be able to advise you on the abovementioned requirements on OSD (if they apply).

Kind Regards,

Zarko Cvetkovic
Senior Development Engineer

P 9936 8100
E council@northsydney.nsw.gov.au

www.northsydney.nsw.gov.au

Appendix D

Jemena Information

Sydney Metro Station Servicing Assessment

1. PURPOSE

The aim of this document is to provide a preliminary assessment of Jemena's existing infrastructure and outline Jemena Gas Network's capacity to service the new developments around Sydney Metro Stations. Where there is insufficient capacity to service the development then a gas reinforcement is specified. All gas loads were supplied by TfNSW for the Sydney Metro Stations; Victoria Cross, Pitt Street, Crows Nest and Marrickville Stabling Yards. Recommendations on route selection and reinforcements are subject to change with a detailed review of the proposed gas supply options.

2. COMMERCIAL FEASIBILITY

Natural Gas is available in the vicinity of these developments and may be able to supply these proposals.

Our policy is to supply all developments wherever possible, depending upon economic viability.

In consideration of our shareholders' interests and under NSW regulation, Jemena Gas Networks (NSW) Ltd is required to ensure that any connection to the natural gas distribution system is commercially viable and therefore must assess each request for supply on an individual basis.

Upon the provision of the final layout and load configurations for the developments a full economic evaluation can be undertaken to determine the viability of supplying natural gas to the site, as a contribution may be required to assist in the economic viability of the proposal.

There will costs associated with disconnections and any relocation works that are required.

To assist in the planning of supply to the development I can confirm that;

- The sites to be developed are currently reticulated with gas.
- Where the existing network in an area does not have sufficient capacity to supply the additional load a network reinforcement will be required. A contribution may be required.
- Costs will be associated with any works that require Jemena to relocate the existing gas network.
- See attached for proposed network reinforcements.

3. VICTORIA CROSS

3.1 GAS LOADS

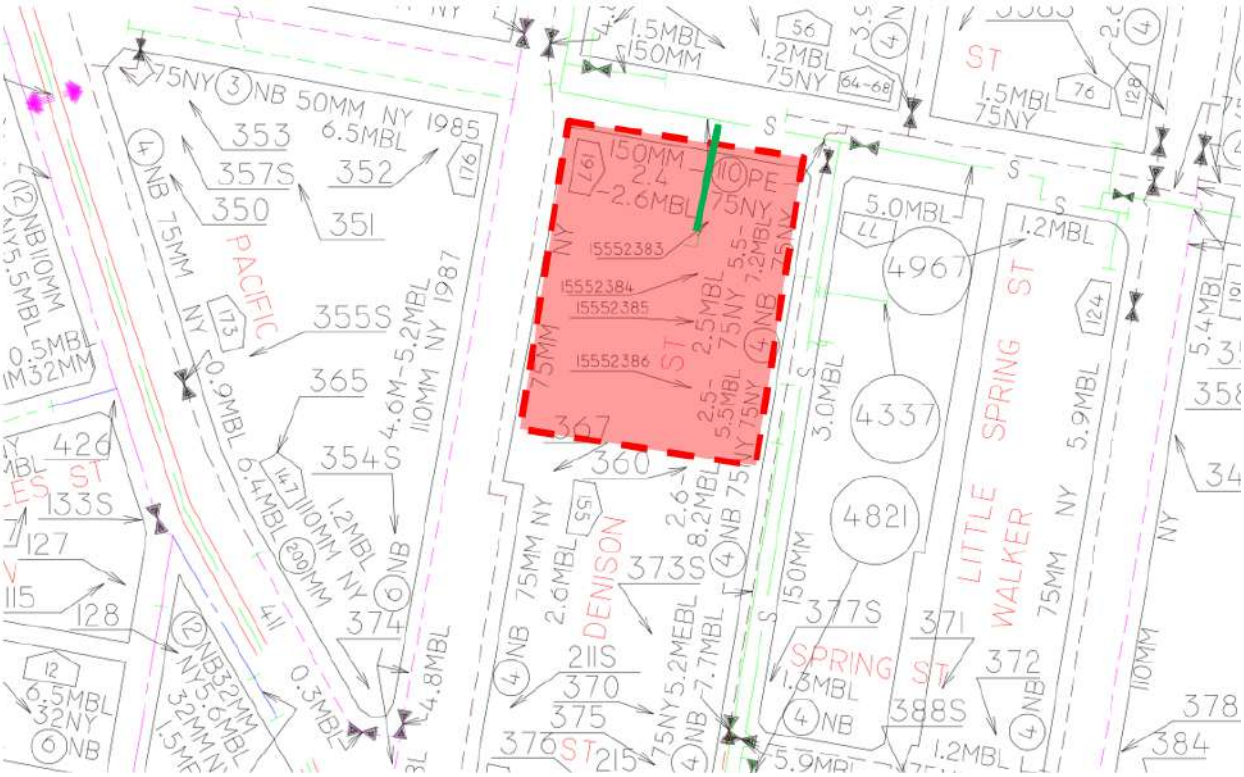
The Gas loads were provided by TfNSW and used in modelling the loads at Victoria Cross Station in Miller Street, North Sydney.

Building	Gas Load (MJ)		Total
	Domestic Hot Water	Mechanical Plant	
EOT Hot Water	5740	0	5740
Tower Hot Water	49200	0	4920
Mech Use	0	17500	17500
Retail x 17	8500	0	8500
Total	19160	17500	36660

3.2 PROPOSED CONNECTION STRATEGY

The load was modelled on the low pressure and secondary pressure networks. The low pressure network does not have sufficient capacity to support the development. There is sufficient capacity on the secondary network and a secondary service already exists to the site (Figure 1). No reinforcement is required.

Figure 1: Secondary service connection to Victoria Cross (Service already existing)



4. PITT STREET SOUTH

4.1 GAS LOADS

There will be a total of 310 apartments. The Gas Demand Preliminary Calculation supplied by TfNSW did not specify which site (North or South) the apartments were located, therefore for this analysis the load was split evenly across both sites.

4.2 PROPOSED CONNECTION STRATEGY

Pitt St South: The redevelopment is located in the low pressure 7 kPa network. There is sufficient capacity for the low pressure network to support the new developments at Pitt St South, with service connections to the existing 110mm PE main.

Pitt St North: Assuming a gas load of 310 apartments, there is insufficient capacity to meet the proposed demand. As part of the Sydney Light Rail an additional conduit was supplied across George St, South of Bathurst St. In order to meet load demand a 110mm PE main is to be inserted into the conduit and tied into the existing network (Figure 3).

Figure 2: Low pressure service connections of 110mm PE to both highlighted sites

5. CROWS NEST

5.1 GAS LOADS

There are 3 towers to be built around Crows Nest station with the following gas loads

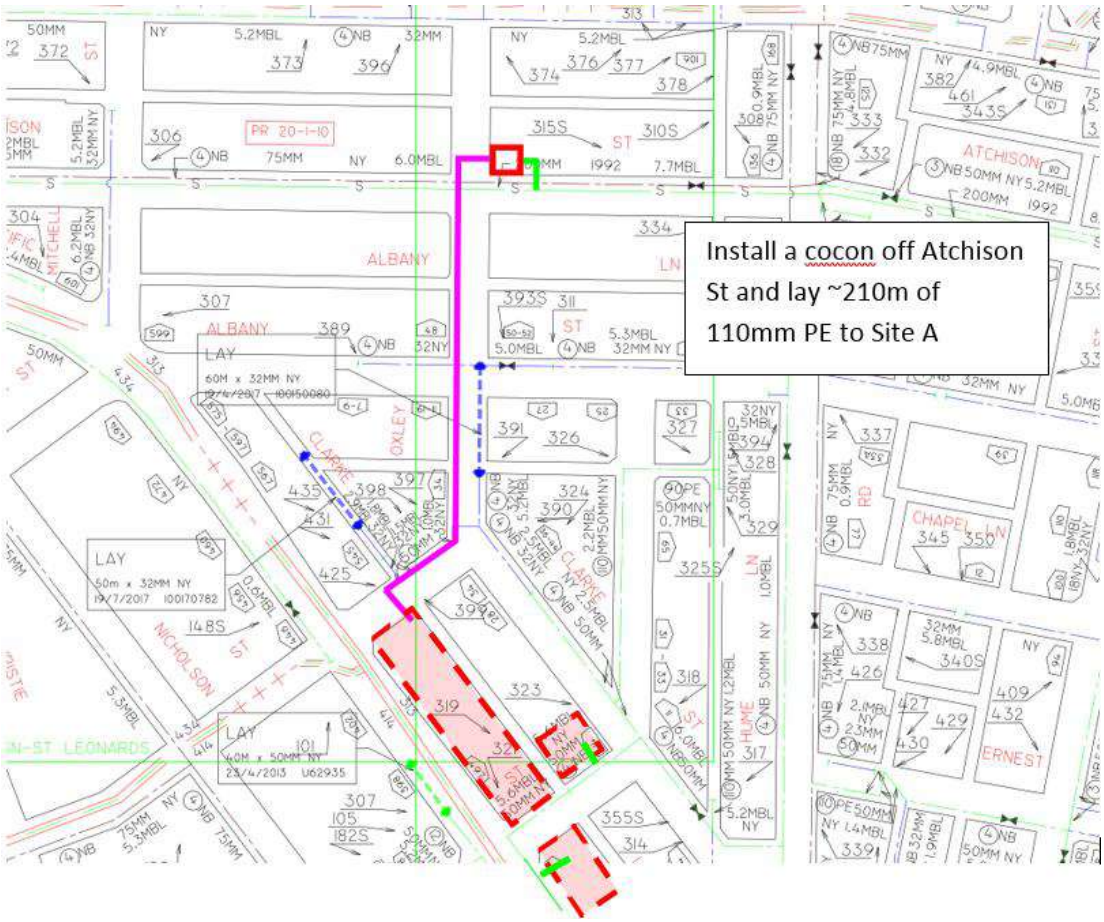
Building	Gas Load (MJ)		Total
	Domestic Hot Water + Cooktops	Mechanical Plant	
Tower A North	26240	11000	37240
Tower A South	4000	3000	7000
Tower B	19680	6500	26180
Site C	400	500	4500
Retail x 6	6000	0	6000
Total	59920	21000	80920

5.2 PROPOSED CONNECTION STRATEGY

Due to the inherent large load required to service this development, reinforcement is required to provide sufficient capacity to the site. The reinforcement option is as follows:

Install one Cocon on Atchison St and lay ~ 210m of 110mm PE from the outlet of the Cocon down Oxley Steet to Site A. Site B and C can be fed off the 50mm NY main (Figure 3).

Figure 3: Medium pressure services with an additional Cocon on Atchison St and mains extension



6. MARRICKVILLE STABLING YARD

6.1 GAS LOADS

The redevelopment of the Marrickville Stabling Yard consists of 15 commercial buildings with 6 retail outlets and 1 café. The total load equates to 7000 MJ/h.

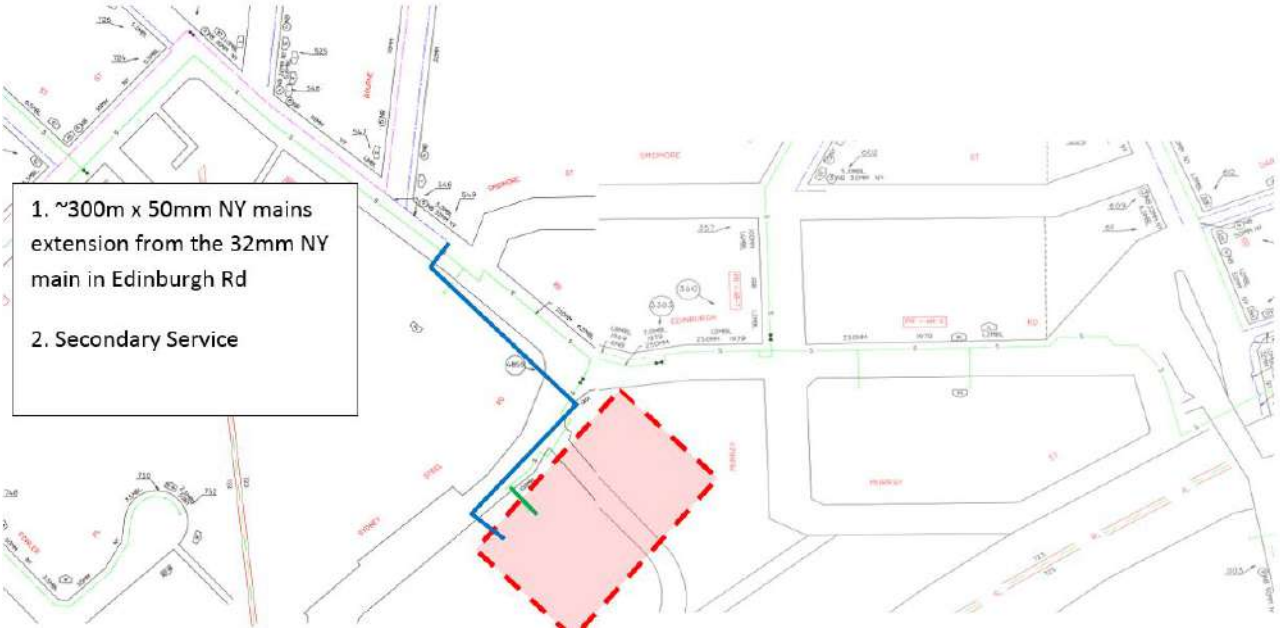
6.2 PROPOSED CONNECTION STRATEGY

There are two options for connection either off the medium or secondary networks, option 1 is the preferred option.:

1. Medium pressure network: A mains extension of ~300m of 50mm NY will be required to get gas to the site (as shown in Figure 3).

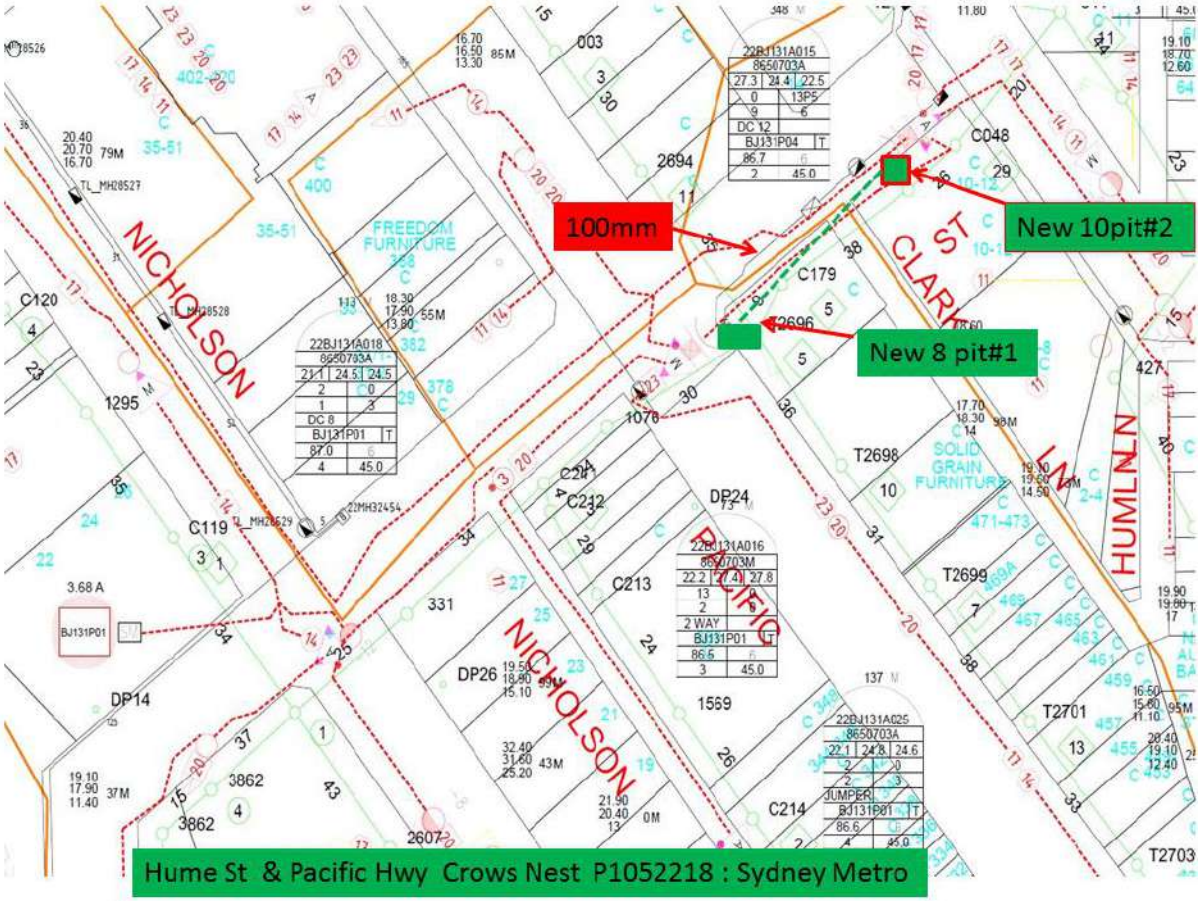
2. Secondary pressure network: A secondary service is already present at the site and will provide enough capacity. The alternative option is to supply the site with a secondary service.

Figure 4: Medium pressure service connection to proposed site



Appendix E

Telecommunication Information


100mm
New 10pit#2
New 8 pit#1
NICHOLSON
CLARK ST
HUMLN N
PACIFIC
NICHOLSON
FREEDOM FURNITURE
SOLID GRAIN FURNITURE
Hume St & Pacific Hwy Crows Nest P1052218 : Sydney Metro

L

K

J

DP

NEW 6 PIT

HAUL & CUTOVER
F STLE 3008 12F DP-AZ

PACIFIC

CLARKE ST

HWY

1xP32 SUBDUCTS (AA)
3xP35 SUBDUCTS (AA)
DIST (AA2)
F NSYD 3016:BQ-AK/1-120 120F/- SMOF FNPEHJ/STD <- (AA3)

F NSYD 3021:NSYD GO-FM/1-312 (AB)
F CHAT 4801:BS-GI/1-312 (AB)
F NSYD 4605:HH-HT/1-312 (AB)
F CHAT 4802:HD-GI/1-624 (AC)
4xP35 SUBDUCTS (AC)
3003:AK-AL/1-12 (AC1)
3009:BQ-CR/1-12 (BC)
2xCBN CABLES (BC)
c69:M1-200 800 CPIUT - (CA)
100DEAD
c69:M301-800
F NSYD 4604:HH-HI/1-312 (CA)
3009:YY-BQ/1-24 (CA)
3008:DP-AZ/1-12 (CA)
3009:BQ-GH/1-6 (CA)
F CHAT 1001:FL-NSYD GV/1-312 (CB)
F NSYD 1002:NSYD GP-YY/1-120 (CB)
1xP32 SUBDUCTS (CB)
OC MP12 MO1 01/2029 (CB1)
3xP35 SUBDUCTS (CC)
F CHAT 272:CY-NSYD FO/1-120 (CC1)
2xP32 SUBDUCTS (DA)
OC UET1697 M01 4/2025 (DA1)
OC IX926 MO2 9/2027 (DA2)
F CHAT 1026:BS-GI/1-312 (DB)
F CHAT 1025:BS-GI/1-312 (DB)
2xP32 SUBDUCTS (DB)
OC FIRSTPATH04 MO1 11/2028 (DB2)
OC IX1850 DBOR1 11/2030 (DB1)
2xP32 SUBDUCTS (DC)
OC VOCUS213 DBOR01 05/2031 (DC3)
UET 153 12/2014 (DC1)
1xP28 SUBDUCTS (DC)
OPTUS 485M01 11/2017 (DC2)
F CHAT 1003:BB-NSYD GO/1-312 <- (EA)
F CHAT 1002:FL-NSYD GN/1-312 <- (EA)
1xP32 SUBDUCTS (EA)
OC VOCUS938M01 07/2031 (EA1)
c58:M1-1800 1800 CPIUT <- (EB)
F NSYD 4602:HH-HI/1-312 (EC)
3xP32 SUBDUCTS (EC)

A100 E80

P100

OC IX1850 M02 8/2028(AA)
OC IX1850 M02 BREAKOUT

1xP32 SUBDUCTS (AD)
3xP35 SUBDUCTS (AD)
F NSYD 3016:BQ-AK/1-120 (AD1)
OC IX2499 DBOR1 12/2030(AA)
OC IX2499 DBOR1 BREAKOUT

OC IX2499 DBOR1 12/2030(AA)
OC IX2499 DBOR1 BREAKOUT

A100
c58:M1701-1800 200 PIUT UA (AA)
100DEAD
50DEAD 200 PIUT UA (AA)
c58:M1401-1550
4xDIST (AA)

447m

BQ SS05

OPTUS 485M01 BREAKOUT

P50 250/1800
c58:M1401-1550
c58:M1701-1800
480m
DA50

A100
50DEAD 600 CPIUT (AA)
c58:M1401-1600
c58:M1701-1800
250DEAD
4xDIST (AA)
CBN CABLE (AA)

A100
CBN CABLE (AA)
1xP32 SUBDUCTS (AA)
OC IX2499 DBOR1 12/2030 (AA1)

P100

A100
DIST (AA)
CBN CABLE (AA)
1xP32 SUBDUCTS (AA)
OC FIRSTPATH04 MO1 11/2028(AA1)
OC FIRSTPATH04 MO1 11/2028(AA)
OC FIRSTPATH04 MO1 BREAKOUT
P100

c88:M2401-2600 200 CPIUT (AA)
F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD <- (AA)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD <- (AA)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD <- (AA)
3xCBN CABLES (AA)

F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD (AA)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD (AA)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD (AA)
7xDIST (AA)
4xCBN CABLES (AA)
CBN CABLE (AA)
c88:M2401-2600 200 CPIUT (AB)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD <- (AB)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD <- (AB)
2xCBN CABLES (AB)
1xP32 SUBDUCTS (BA)
OC VOCUS781 M01 12/2030 (BA1)

A100

c88:M2401-2900/600 CPIUT (CC)
100DEAD
1xP32 SUBDUCTS (AA)
OC VOCUS781 M01 12/2030 (AA1)
c88:M2401-2600 200 CPIUT (AB)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD <- (AB)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD <- (AB)
3xCBN CABLES (AB)

A100

F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD (AA)
1xP28 SUBDUCTS (AA)
OPTUS864 M01 10/2016 (AA1)

A100

OPTUS 864M01 BREAKOUT

P100
OC VOCUS781 M01 12/2030(AA)
OC VOCUS781 M01 BREAKOUT

Vacant

B14

A100
c88:M2601-2900 300/0.51 APIUT (AA)
F NSYD 3002:AZ-B14/1-6 6F/- (AA)

P100
OC VOCUS781 M01 12/2030(AA)
OC VOCUS781 M01 BREAKOUT

F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD (AA)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD (AA)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD (AA)
3xDIST (AA)
3xCBN CABLES (AA)

OC VOCUS781 MULTI SUBDUCT JOINER

F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD (AA)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD (AA)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD (AA)
3xCBN CABLES (AA)

NOTE 1

OC UET 1697JC1 SPLICE 4/2010

HUB IN MANHOLE
WARNING ELECTRICITY

OC IX1850 M02 SPLICE 8/2028

3009:BQ-SS05/1-6 6F/- SMOF FNPEHJ/STD (STUB)

P216 200/900
c88:M2401-2600
793m
DA216

A100

F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD (AA)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD (AA)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD (AA)
4xDIST (AA)
5xCBN CABLES (AA)

OC VOCUS781 M01 12/2030(AA)
OC VOCUS781 M01 BREAKOUT

P100

A100

3xDIST (AA)
2xCBN CABLES (AA)
1xP32 SUBDUCTS (AA)
OC FIRSTPATH04 MO1 11/2028(AA1)

A100

CBN CABLE (AA)
1xP32 SUBDUCTS (AA)
OC FIRSTPATH04 MO1 11/2028(AA1)
6xDIST (BA)

A100

c72:M1-1200 1200 CP
3008:DP-AZ/1-12 12F/- SMOF
3xCBN CABLES
F NSYD 3002:BA-AZ/1-24 24F/- SMO
F NSYD 3002:AB-BA/1-24 24F/- SMO
3008:AZ-BA/1-12 12F/- SMOF
F NSYD 3002:DK-B161/1-6 6F/- SMO
1xP28 SUBDUCTS
OPTUS 864M01 10/2016
F NSYD 3002:AZ-B14/1-6 6F/- SMO

c88:M2001-2100 100 C
c88:M1701-1800 100 C
F NSYD 3002:AZ-B57/1-12 12F/- S

c88:M3801-4000 200 C
c88:M1601-1700 100 C
c88:M3401-3500 100 C
F NSYD 3002:AZ-B11/1-6 6F/- S

P100

NOTE 1:
INCORPORATE A100 CONDUIT BETWEEN SEG. B & SEG. I INTO NEW 8 PIT @ SEG. C.
EXPOSE LOCAL & FOXTEL CABLES TO THE SOUTH IN NEW 8 PIT @ SEG C.

EXISTING DEEP MANHOLE

NEW 8 PIT

DEMOLISH MANHOLE

NEW 2X3 MANHOLE & NEW PILLAR P216 RELOCATED

B D I E F G

A C H

1xP100 x 24.0 CONCRETE ENCASE
HAUL & CUTOVER
F STLE 3008 12F DP-AZ
F STLE 3009 6F BQ-B28
F NSYD 3016 36F BQ-B161
3 x CX75

2 x PE110 x 38.0m HDPE CONDUITS INCORPORATE INTO NEW BRIDGE FOOTPATH SEG. C - SEG.H
HAUL & CUTOVER
F STLE 3008 12F DP-AZ
F STLE 3009 6F BQ-B28
F NSYD 3016 36F BQ-B161
c88 : M2401-2600 200/0.40
3 x CX75 & LOCAL CABLE

HAUL & CUTOVER
F STLE 3008 12F DP-AZ
F STLE 3009 6F BQ-B28
F NSYD 3016 36F BQ-B161

LEGEND

- EXISTING TELSTRA MANHOLE
- PROPOSED TELSTRA MANHOLE
- EXISTING TELSTRA 5PIT
- PROPOSED TELSTRA 5PIT
- EXISTING TELSTRA
- PROP. TELSTRA CONSTRUCTION
- ABANDONED or RECOVERED PLANT
- DATA CORRECTION (CPR)
- PLANT INFORMATION NOT FOUND

WARNING

THE PREPARATION OF THIS DESIGN HAS BEEN UNDERTAKEN GIVING THE CONSIDERATION TO THE EXISTING SERVICES. THE PROJECT CONSTRUCTOR IS, HOWEVER,WHOLLY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF EXISTING SERVICES BEFORE CONSTRUCTION COMMENCES AND NO RESPONSIBILITY NOR LIABILITY WILL BE ACCEPTED BY THE DESIGNER OF THIS PROJECT FOR DAMAGES TO EXISTING SERVICES AS A RESULT OF THIS DESIGN.

SIGNED.....

WARNING

THIS PLAN CONTAINS COMMERCIALLY SENSITIVE INFORMATION AND IS TO BE TREATED ACCORDINGLY NO SUCH INFORMATION IS TO BE PASSED ON TO OTHER PARTIES WITHOUT THE WRITTEN CONSENT OF THE TELSTRA CORPORATION

NOTE:
DISTANCES ARE INDICATIVE ONLY DO NOT SCALE.

x x x ATTENTION CONSTRUCTORS x x x

FOR COMPLIANCE PURPOSES

DO NOT CHANGE THE WORK SPECIFICATION OF THIS PROJECT WITHOUT FIRST CHECKING WITH THE DESIGNER.

DO NOT SCALE

NOTE:
IF ACTUAL WORK DONE DIFFERS FROM THE ORIGINAL DESIGNED WORK THE PERSON PERFORMING THE WORK MUST AMEND THE COPY OF THIS PLAN ACCORDINGLY.

DANGER

BEFORE EXCAVATING CHECK FOR POWER CABLES AND GAS PIPES, ENSURE THAT YOU HAVE CALLED
"1100 DIAL BEFORE YOU DIG"
FOR ALL SERVICES LOCATION

IT'S HOW WE CONNECT

ISSUE	DATE	AMENDMENT
1	16.11.17	ORIGINAL
2	24.11.17	SCOPE OF WORKS
3	19.12.17	REVISED SCOPE OF WORKS

APPROVED:	MS
CHECKED:	CD
EXAMINED:	MS
ISSUE DATE:	--
DRAWING FILE:	.dwg

Dwg location: RW/SECT / CH - CH

REV. 1
Sheet 1 of 1

TELSTRA NETWORK IMPACTS

DRG. TITLE SYDNEY METRO CITY & SOUTH WEST
PROTECTION AND RELOCATION
OF TELSTRA NETWORK PLANT
SCOPE OF WORKS

CC & DA NETORK
CROWS NEST STATION PRECINCT

Appendix E

Telecommunication Information

L

K

J

DP

NEW 6 PIT

HAUL & CUTOVER
F STLE 3008 12F DP-AZ

PACIFIC

CLARKE ST

HWY

1xP32 SUBDUCTS (AA)
3xP35 SUBDUCTS (AA)
DIST (AA2)
F NSYD 3016:BQ-AK/1-120 120F/- SMOF FNPEHJ/STD <- (AA3)

F NSYD 3021:NSYD GO-FM/1-312 (AB)
F CHAT 4801:BS-GI/1-312 (AB)
F NSYD 4605:HH-HT/1-312 (AB)
F CHAT 4802:HD-GI/1-624 (AC)
4xP35 SUBDUCTS (AC)
3003:AK-AL/1-12 (AC1)
3009:BQ-CR/1-12 (BC)
2xCBN CABLES (BC)
c69:M1-200 800 CPIUT - (CA)
100DEAD
c69:M301-800
F NSYD 4604:HH-HI/1-312 (CA)
3009:YY-BQ/1-24 (CA)
3008:DP-AZ/1-12 (CA)
3009:BQ-GH/1-6 (CA)
F CHAT 1001:FL-NSYD GV/1-312 (CB)
F NSYD 1002:NSYD GP-YY/1-120 (CB)
1xP32 SUBDUCTS (CB)
OC MP12 MO1 01/2029 (CB1)
3xP35 SUBDUCTS (CC)
F CHAT 272:CY-NSYD FO/1-120 (CC1)
2xP32 SUBDUCTS (DA)
OC UET1697 M01 4/2025 (DA1)
OC IX926 MO2 9/2027 (DA2)
F CHAT 1026:BS-GI/1-312 (DB)
F CHAT 1025:BS-GI/1-312 (DB)
2xP32 SUBDUCTS (DB)
OC FIRSTPATH04 MO1 11/2028 (DB2)
OC IX1850 DBOR1 11/2030 (DB1)
2xP32 SUBDUCTS (DC)
OC VOCUS213 DBOR01 05/2031 (DC3)
UET 153 12/2014 (DC1)
1xP28 SUBDUCTS (DC)
OPTUS 485M01 11/2017 (DC2)
F CHAT 1003:BB-NSYD GO/1-312 <- (EA)
F CHAT 1002:FL-NSYD GN/1-312 <- (EA)
1xP32 SUBDUCTS (EA)
OC VOCUS938M01 07/2031 (EA1)
c58:M1-1800 1800 CPIUT <- (EB)
F NSYD 4602:HH-HI/1-312 (EC)
3xP32 SUBDUCTS (EC)

A100 E80

P100

OC IX1850 M02 8/2028(AA)
OC IX1850 M02 BREAKOUT

1xP32 SUBDUCTS (AD)
3xP35 SUBDUCTS (AD)
F NSYD 3016:BQ-AK/1-120 (AD1)
OC IX2499 DBOR1 12/2030(AA)
OC IX2499 DBOR1 BREAKOUT

OC IX2499 DBOR1 12/2030(AA)
OC IX2499 DBOR1 BREAKOUT

A100
c58:M1701-1800 200 PIUT UA (AA)
100DEAD
50DEAD 200 PIUT UA (AA)
c58:M1401-1550
4xDIST (AA)

447m

BQ SS05

OPTUS 485M01 BREAKOUT

P50 250/1800
c58:M1401-1550
c58:M1701-1800
480m
DA50

A100
50DEAD 600 CPIUT (AA)
c58:M1401-1600
c58:M1701-1800
250DEAD
4xDIST (AA)
CBN CABLE (AA)

A100
CBN CABLE (AA)
1xP32 SUBDUCTS (AA)
OC IX2499 DBOR1 12/2030 (AA1)

P100

A100
DIST (AA)
CBN CABLE (AA)
1xP32 SUBDUCTS (AA)
OC FIRSTPATH04 MO1 11/2028(AA1)
OC FIRSTPATH04 MO1 11/2028(AA)
OC FIRSTPATH04 MO1 BREAKOUT
P100

c88:M2401-2600 200 CPIUT (AA)
F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD <- (AA)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD <- (AA)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD <- (AA)
3xCBN CABLES (AA)

F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD (AA)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD (AA)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD (AA)
7xDIST (AA)
4xCBN CABLES (AA)
CBN CABLE (AA)
c88:M2401-2600 200 CPIUT (AB)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD <- (AB)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD <- (AB)
2xCBN CABLES (AB)
1xP32 SUBDUCTS (BA)
OC VOCUS781 M01 12/2030 (BA1)

A100

c88:M2401-2900/600 CPIUT (CC)
100DEAD
1xP32 SUBDUCTS (AA)
OC VOCUS781 M01 12/2030 (AA1)
c88:M2401-2600 200 CPIUT (AB)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD <- (AB)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD <- (AB)
3xCBN CABLES (AB)

A100

F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD (AA)
1xP28 SUBDUCTS (AA)
OPTUS864 M01 10/2016 (AA1)

A100

OPTUS 864M01 BREAKOUT

P100
OC VOCUS781 M01 12/2030(AA)
OC VOCUS781 M01 BREAKOUT

Vacant

B14

A100
c88:M2601-2900 300/0.51 APIUT (AA)
F NSYD 3002:AZ-B14/1-6 6F/- (AA)

P100
OC VOCUS781 M01 12/2030(AA)
OC VOCUS781 M01 BREAKOUT

F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD (AA)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD (AA)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD (AA)
3xDIST (AA)
3xCBN CABLES (AA)

OC VOCUS781 MULTI SUBDUCT JOINER

F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD (AA)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD (AA)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD (AA)
3xCBN CABLES (AA)

NOTE 1

OC UET 1697JC1 SPLICE 4/2010

HUB IN MANHOLE
WARNING ELECTRICITY

OC IX1850 M02 SPLICE 8/2028

3009:BQ-SS05/1-6 6F/- SMOF FNPEHJ/STD (STUB)

P216 200/900
c88:M2401-2600
793m
DA216

A100

F NSYD 3016:BQ-B161/1-36 36F/- SMOF FNPEHJC/STD (AA)
3008:DP-AZ/1-12 12F/- SMOF FNPEHJ/STD (AA)
3009:BQ-B28/1-6 6F/- SMOF FNPEHJ/STD (AA)
4xDIST (AA)
5xCBN CABLES (AA)

OC VOCUS781 M01 12/2030(AA)
OC VOCUS781 M01 BREAKOUT

P100

A100

3xDIST (AA)
2xCBN CABLES (AA)
1xP32 SUBDUCTS (AA)
OC FIRSTPATH04 MO1 11/2028(AA1)

A100

CBN CABLE (AA)
1xP32 SUBDUCTS (AA)
OC FIRSTPATH04 MO1 11/2028(AA1)
6xDIST (BA)

A100

c72:M1-1200 1200 CP
3008:DP-AZ/1-12 12F/- SMOF
3xCBN CABLES
F NSYD 3002:BA-AZ/1-24 24F/- SMO
F NSYD 3002:AB-BA/1-24 24F/- SMO
3008:AZ-BA/1-12 12F/- SMOF
F NSYD 3002:DK-B161/1-6 6F/- SMO
1xP28 SUBDUCTS
OPTUS 864M01 10/2016
F NSYD 3002:AZ-B14/1-6 6F/- SMO

c88:M2001-2100 100 C
c88:M1701-1800 100 C
F NSYD 3002:AZ-B57/1-12 12F/- S

c88:M3801-4000 200 C
c88:M1601-1700 100 C
c88:M3401-3500 100 C
F NSYD 3002:AZ-B11/1-6 6F/- S

P100

NOTE 1:
INCORPORATE A100 CONDUIT BETWEEN SEG. B & SEG. I INTO NEW 8 PIT @ SEG. C.
EXPOSE LOCAL & FOXTEL CABLES TO THE SOUTH IN NEW 8 PIT @ SEG C.

EXISTING DEEP MANHOLE

NEW 8 PIT

DEMOLISH MANHOLE

NEW 2X3 MANHOLE & NEW PILLAR P216 RELOCATED

B D I E F G

A C H

1xP100 x 24.0 CONCRETE ENCASE
HAUL & CUTOVER
F STLE 3008 12F DP-AZ
F STLE 3009 6F BQ-B28
F NSYD 3016 36F BQ-B161
3 x CX75

2 x PE110 x 38.0m HDPE CONDUITS INCORPORATE INTO NEW BRIDGE FOOTPATH SEG. C - SEG.H
HAUL & CUTOVER
F STLE 3008 12F DP-AZ
F STLE 3009 6F BQ-B28
F NSYD 3016 36F BQ-B161
c88 : M2401-2600 200/0.40
3 x CX75 & LOCAL CABLE

HAUL & CUTOVER
F STLE 3008 12F DP-AZ
F STLE 3009 6F BQ-B28
F NSYD 3016 36F BQ-B161

LEGEND

- EXISTING TELSTRA MANHOLE
- PROPOSED TELSTRA MANHOLE
- EXISTING TELSTRA 5PIT
- PROPOSED TELSTRA 5PIT
- EXISTING TELSTRA
- PROP. TELSTRA CONSTRUCTION
- ABANDONED or RECOVERED PLANT
- DATA CORRECTION (CPR)
- PLANT INFORMATION NOT FOUND

WARNING

THE PREPARATION OF THIS DESIGN HAS BEEN UNDERTAKEN GIVING THE CONSIDERATION TO THE EXISTING SERVICES. THE PROJECT CONSTRUCTOR IS, HOWEVER,WHOLLY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF EXISTING SERVICES BEFORE CONSTRUCTION COMMENCES AND NO RESPONSIBILITY NOR LIABILITY WILL BE ACCEPTED BY THE DESIGNER OF THIS PROJECT FOR DAMAGES TO EXISTING SERVICES AS A RESULT OF THIS DESIGN.

SIGNED.....

WARNING

THIS PLAN CONTAINS COMMERCIALLY SENSITIVE INFORMATION AND IS TO BE TREATED ACCORDINGLY NO SUCH INFORMATION IS TO BE PASSED ON TO OTHER PARTIES WITHOUT THE WRITTEN CONSENT OF THE TELSTRA CORPORATION

NOTE:
DISTANCES ARE INDICATIVE ONLY DO NOT SCALE.

x x x ATTENTION CONSTRUCTORS x x x

FOR COMPLIANCE PURPOSES

DO NOT CHANGE THE WORK SPECIFICATION OF THIS PROJECT WITHOUT FIRST CHECKING WITH THE DESIGNER.

DO NOT SCALE

NOTE:
IF ACTUAL WORK DONE DIFFERS FROM THE ORIGINAL DESIGNED WORK THE PERSON PERFORMING THE WORK MUST AMEND THE COPY OF THIS PLAN ACCORDINGLY.

DANGER

BEFORE EXCAVATING CHECK FOR POWER CABLES AND GAS PIPES, ENSURE THAT YOU HAVE CALLED
"1100 DIAL BEFORE YOU DIG"
FOR ALL SERVICES LOCATION

IT'S HOW WE CONNECT

ISSUE	DATE	AMENDMENT
1	16.11.17	ORIGINAL
2	24.11.17	SCOPE OF WORKS
3	19.12.17	REVISED SCOPE OF WORKS

APPROVED:	MS
CHECKED:	CD
EXAMINED:	MS
ISSUE DATE:	--
DRAWING FILE:	.dwg

Dwg location: RW/SECT / CH - CH

REV. 1
Sheet 1 of 1

TELSTRA NETWORK IMPACTS

DRG. TITLE SYDNEY METRO CITY & SOUTH WEST
PROTECTION AND RELOCATION
OF TELSTRA NETWORK PLANT
SCOPE OF WORKS

CC & DA NETORK
CROWS NEST STATION PRECINCT

Appendix F

Ausgrid Information

Project Number: SC12483

Establishment of Upper Level Chamber S078962 ‘CLARKE OXLEY NO2’ & CP.78963 ‘CLARKE OXLEY NO3’. Tower A - North

497 Pacific Highway, Crows Nest

Design Information

Site Specific Requirements - Complex

Date: 24.01.2018

CONTENTS

SITE SPECIFIC DESIGN INFORMATION REQUIREMENTS

The Design Information Site Specific Requirements Complex is complementary to, and must be read in conjunction with, the Design Information General Requirements, which can be found on the Ausgrid web site.

1. Ausgrid Project References

SAP Project Number	SC12483
Prjtrak Number	XCH014094

2. Ausgrid Contact Details

Note that this information is not to be placed on the design.

Ausgrid Contact	Andrew Busch
Telephone No	96639340
Email Address	abusch@ausgrid.com.au

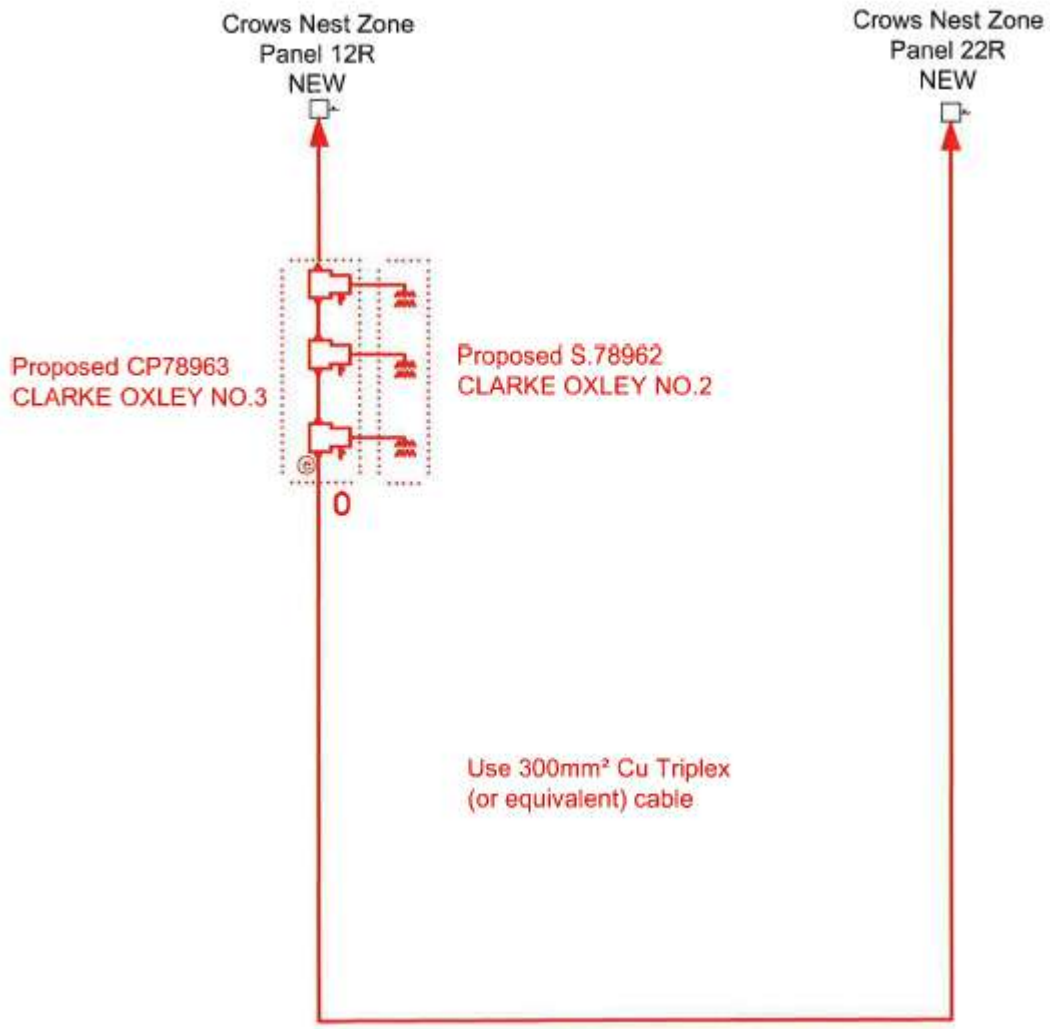
3. Details of proposed Ausgrid Projects in the vicinity of Development

This project will be related to future project SC12496 – 2 x 1500kVA chamber substation that is also to be installed in Tower A.

4. Network Extension Connection Point

4.1. High Voltage Connection Point

Zone substation Crows Nest Zone - 11kV feeder: between 12R and 22R (please see below)

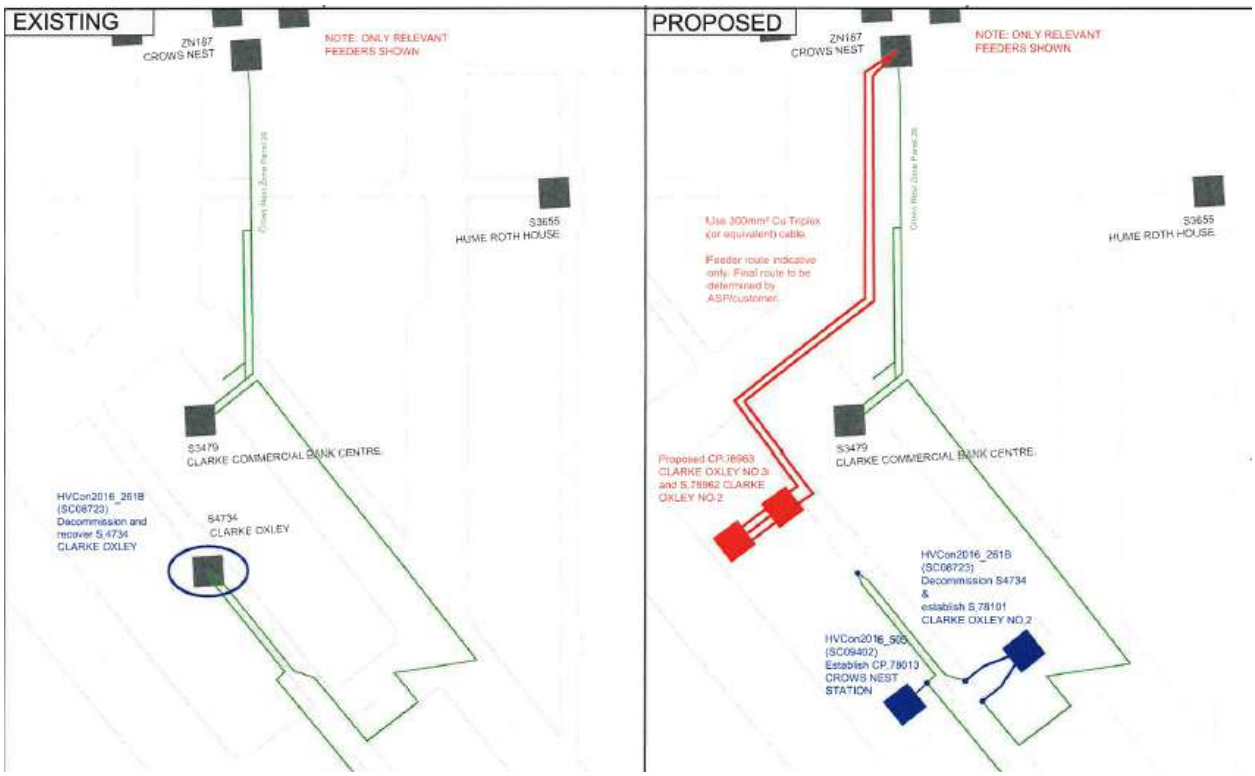


5. Details of Ausgrid Network in Vicinity of the Development

Recorded details of the Ausgrid network, including cable codes, soil codes, etc, are shown in Ausgrid's WebGIS. The ASP/3 designer must login to the WebGIS to obtain relevant information. The ASP/3 designer should contact Ausgrid for any further clarification or if information appears to be missing. Note: Ausgrid's WebGIS information has not been verified against actual site assets. The ASP/3 designer is responsible for the accuracy of information on designs and it is strongly advised that the ASP/3 designer verifies WebGIS asset details on site prior to undertaking the design.

6. Proposed Works

Alter the existing high voltage and/or low voltage network systems, in accordance with the schematic and/or graphical representation, for the required electrical works as shown on the attached and/or following drawing(s).



6.1. Extension Works

Fit out a 3 x 1500kVA transformer chamber substation that is to be constructed on the development property either within the proposed building or as a freestanding structure.

Install low voltage interconnection(s) from the proposed substation(s) to the existing low voltage Network reticulation.

7. Customer Point of Supply (Connection Point)

Provide a 4080amp three phase low voltage point of supply at the low voltage switchgear terminals within the chamber substation enclosure.

8. Fault Level

11kV node: On the HV side of the proposed S.78962 CLARKE OXLEY NO.2

~ Existing maximum three phase 11kV fault level is 7.70kA.

~

9. Cable/Conductor Route and Type

9.1. Route Information

It is generally the responsibility of the ASP/3 designer to select an appropriate route. However, Ausgrid reserves the right to require variation(s) of any proposed cable route.

Ausgrid makes no warranty expressed or otherwise that any proposed route depicted in the design information by Ausgrid is suitable for the intended purpose.

9.2. Underground

11kV	11KV 300CU1 EPR 70 CU(WS) Z YQ / Triplex.
Low Voltage	LV 240AL4XQZ/SAC
Street Lighting	Sydney & Central Coast Area (Refer to NS112 & NS119) 16CU2 XQZ or 16CU4 XQZ
SCADA / Telecontrol	UGFO - 60 Fibre Nylon Jacketed Dry Core Cable

9.3. Conduits

Spare Conduits available for use	NIL
Spare conduits to be laid as part of this project	one (1) spare 63mm conduit (for future optic fibre pilot cable use), is to be installed in association with all 11kV cable trenches. One spare HV conduit to be installed for each 11kV cable. Sydney CBD area use 125mm conduit all other areas 150mm conduit.

9.4. Protection

Protection	NIL

10. EQUIPMENT

10.1. Multiple Transformer Chamber Substation

Substation Number	S078962	Substation Name	CLARKE OXLEY NO2		
Ultimate Capacity	3 x 1500kVA transformers		Initial Capacity	3 x 1500kVA transformers	
Rating (Firm/Non-Firm)	4200A (firm – Summer) The above is for Dry type transformers (NS109)		Load Cycle	E: Mixed Predominantly Industrial / Commercial	
Voltage Ratio	11000/433		Vector Group	Dyn 1	
Description				Stock Code	Quantity
PowerTransformers	1500kVA oil filled			180359	
	1500kVA dry type			180361	3 (based on initial upper level proposal)
HV Switchgear	Lucy Sabre Ring Main Isolator Circuit Breaker			178072	TBD by ASP3
	Lucy FRMU RMI Ring Main Isolator Switch Fuse			125252	
	ABB Safelink SF6 3 Way Ring Main Isolator Switch Fuse Unit			179642	
	ABB Safelink SF6 3 Way Isolating and Earthing Switch			180232	

LV Board "E" type low voltage board that consists of free standing modular units as described.	3000amp ACB incoming panel un-motorised (LV isolation of the transformer)	179615	3
	3000amp ACB bus section switch panel	179616	1
	3000amp ACB customer point of supply panel – cable	179617	TBD by ASP3
	3000amp ACB customer point of supply panel – busbar	179995	TBD by ASP3
	2000amp ACB incoming panel un-motorised	179991	
	2000amp switch outgoing with 1000 - 1600amp fuses	179993	
	800/800 amp SAIF fused distributor panel	179990	TBD by ASP3
	400/400/800 amp SAIF fused distributor panel	179651	TBD by ASP3
	400/400/400/400amp SAIF fused distributor panel	179618	TBD by ASP3
	Surge arrestor and 62amp auxiliary fuse panel (Right hand and/or Left hand)	180221 (RH) 179619 (LH)	TBD by ASP3

~ Unless detailed above the ASP/1 desinger is to noimiate the LV board arrangment.

~ Customer to procure the whole LV board (note: lead times are in the order of 24 weeks).

~ Materail cost of the LV board component(s) funded by Ausgrid is reimbursed after substation commissioning.

~ Any stock item not purchased from Ausgrid must conform with Ausgrid's current specifications.

10.1.1. Multiple Transformer Chamber Substation Protection Equipment

Required Protection	Optical Arc Flash Detection Transformer Differential Transformer Over-Current & Earth Fault Customer Over-Current		
Description		Stock Code	Quantity
Protection Panels	Wall Mounted OAFD/Tx Protection Relay panel	182546	1 x number of transformers
	OAFD Indicator Panel	182544	1
	Wall Mounted Protection Relay Panel - Single Customer Overcurrent	182545	1 x number of Customer LVCB
Current Transformers Excluding components included in the "E" Type LV Board	400/5 Earth Fault Indicator CT (10P2.5F5)	177474	1
	100/5 HV Differential CT (10P25F20)	89722	3 x number of HV RMICB
	2450/1837/2.89 OAFD EF Check Epoxy CT	67173	1 x number of transformers
Relays	Earth Fault Indicator 3 - 5 amps Relay	61853	1
	K3M Differential Fuse Relay	91058	1 x number of OAFD/TX protection panels

	MICOM P115 Relay (24/48V AC/DC)	182547	1 x number of OAFD/TX protection panels 1 x number of Customer LVCB
	SEL751A Relay	182548	None 1 x number of OAFD/TX protection panels
Miscellaneous	Marshalling Box - Polynova PC 360mm (H) x 360mm (W) x 205mm (D) Manufacturer:- B&R Enclosures Pty Ltd Catalogue No. PC363620	To be obtained from external supplier	1
Battery Items	Battery Rack Insulator	95323	20
	Battery Rack Acrylic Washer	65235	20
	Battery Rack Presspahn Washer	59543	20
	Battery Set 10 volt 8 Cell Alkaline	96602	8
	Battery Charger - 30V trickle type	75168	1
	30V DC battery test box	123703	1
	Battery Charger - 48V float type	182540	1
SCADA	SCADA Cabinet for OAFD Substations complete with RTU Assembly	182585	1
Note: any stock item not purchased from Ausgrid must conform with Ausgrid's current specifications.			

11. Asset Number Allocation

During the design stage the ASP/3 designer will need to request from Ausgrid any additional asset numbers.

12. Apportionment of Costs

The information this section contains is based on assumptions of the likely design solution. Certification of a design that does not conform to such assumptions may require Ausgrid to reassess the apportionment of costs and funding of the project, including re-assessment of any quotations issued prior to Design Certification.

12.1. Funding

At this stage Ausgrid will fund the following works for the development and anything not listed is funded by the customer. Where applicable, the amount(s) to be paid by Ausgrid will detailed on the Schedule to the Certified Design.

- Low voltage mains components within dedicated public roadways and/or the substation property rights area(s) used for supplying Network loads and are beyond the development property as follows.
  - ~ Low voltage interconnection from proposed substation to the adjacent low voltage network.
- The installation of spare conduits (excluding trenching and under bores) as follows.
  - ~ The installation of the fibre optic pilot cable conduit along the high voltage cable and /or conduit route.
- Trenching for the installation of Ausgrid funded cable or conduit installations that have only Ausgrid funded components installed.

13. Design Information Attachments

The following documentation is readily available and can be found on our website www.ausgrid.com.au

- Design Information – General Terms and Conditions document.
- Ausgrid's external CAD design template.
- Design Certification Check Sheet.
- Asset Number Request Spreadsheet.
- Asset Valuation Spreadsheet (AVS).
- Street Lighting Acceptance Form(s).
- Network Earthing Information Sheet.

The following can only be obtained from the Ausgrid WebGIS portal.

- A translated GIS extract of the proposed work area in DWG format (includes soil codes).
- Relevant additional asset information including cable codes.
- Relevant system diagram(s). NOTE – Loads and ratings shown on system diagrams is for internal Ausgrid use only.
- Environmental Analysis report.

The ASP/3 designer intending to undertake the design must obtain and use the electronic format of the relevant design information attachments (refer to NS104).

14. Remarks / Other Comments

The ASP/3 designer needs to contact Ausgrid early in the design phase should any of the proposed works require an alteration and/or extension to the Ausgrid fibre optic network. Ausgrid will then advise the ASP/3 designer of the scope of fibre optic network works that needs to be undertaken by Ausgrid and the works that will need to be done by the ASP/1. Generally Ausgrid only undertakes the final terminations and commissioning of the fibre optic network installation, however, the fibre optic network design and funding review is undertaken on a case by case basis.

The following table specifies LV link usage and link asset numbering requirements.

LV1-61 K & N switch pillar: usage	Link numbers required on Design	Link numbers required in Field
Not Permitted	Yes: but only normally open LV links within single and double link switch pillars are allocated an additional asset number for the link(s).	Yes: but only normally open LV links within single and double link switch pillars are allocated an additional asset number for the link(s).

Any LV underground to overhead transition points that connect directly to a chamber substation (ie the first LV network connection on the LV distributor cable) requires the installation of pole mounted LV links.

Low voltage pillars (new or altered) within Commercial areas must comply with NS224 unless a written variation is agreed with Ausgrid.

Please consult your Contestable Project Coordinator for approval prior to the use of 11kV high voltage stub tee joints (HV3-43) on this project.

15. Design Information Revision History

24.01.2018	Initial issue using template version v180110

DPI2018_0018 Project Number: SC12483

18 January 2018

Sent To: Distribution Planning Manager (Mark Appleton)/
Negotiating Officer – Contestable Connection (Andrew Busch)

Copy to: Branch File 342.11 General (Crows Nest Zone)

PREFERRED POINT OF ENTRY AND HIGH VOLTAGE CONNECTION FOR THE ESTABLISHMENT OF THE CUSTOMER SUBSTATIONS S78962 CLARKE OXLEY NO.2 AND CP78963 CLARKE OXLEY NO.3, 497 PACIFIC HIGHWAY, CROWS NEST.

Following is a reply to your request dated 09 January 2018 and subsequent correspondence requesting the Preferred Point of Entry and HV connections for the above project.

PREFERRED POINT OF ENTRY

The preferred point of entry for the proposed substation is from the Clarke Lane entrance to the site.

ASSOCIATED PROJECTS

THE CONNECTIVITY SHOWN IN THE ATTACHED DIAGRAMS INCLUDES PROPOSED WORKS UNDER HVCON2016_505 (SC09402) and HVCON2016_261B (SC08723). HOWEVER, THIS HV CONNECTION IS NOT DEPENDENT ON THE COMPLETION OF THESE WORKS.

HV CONNECTIONS

1) Refer to attached drawings.

2) Use 300mm^2 Cu Triplex cable (or equivalent).

3) Where performing trenching works, install an ultimate 4 x 150mm duct bank for HV use. If any of these ducts are expected to be used for LV purposes, please contact the Distribution Planner to determine the optimal duct bank size.

VOLTAGE DROPS AND NOMINAL 3 PHASE FAULT LEVELS S.78962 CLARKE OXLEY NO.2

1) Assuming a source three phase Fault Level on the TX12 11kV group busbar at Crows Nest zone substation of 7.93kA, the three phase fault level* on the HV side of the proposed S.78962 CLARKE OXLEY NO.2 is anticipated to be 7.70kA.

2) Assuming a maximum voltage level on the TX12 11kV group busbar at Crows Nest zone substation of 10.55kV, the voltage level* at the proposed S.78962 CLARKE OXLEY NO.2 is anticipated to be 10.54kV(0.09%VD).

*Please note this data is NOMINAL, and for a NORMAL network configuration. It is based on the current data in the GIS, and on the 11kV Busbar fault information provided by Subtransmission Planning. The actual Voltage Drop and 3 Phase Fault Levels may differ (for example) due to network switching, paralleling of Transformers, the effects of future projects, Transformer tap settings, and the currency / accuracy of the GIS data and the 11kV busbar fault level provided. The Fault Level is not the minimum Fault Level for equipment ratings. See NS-114 (Chamber Substations), NS-117 (Kiosks Substations), NS-122 (Pole Mounted Substation) and also refer to "Clause 1.16.4 and 7.5.4" of the New South Wales Service and Installation Rules dated June 2015 Amendment November 2016 for further information.

Notes:-

1. Where single core cables are to be installed for lengths greater than 10 metres, always use bundled single core cables ie.Triplex, unless stated otherwise by Distribution Planning.
2. Conduit banks containing six or more power cable conduits (for use at any voltage level) must be installed as per the TSB requirements as per Section 12.9 of NS130.
3. When cables are installed in Thermally Stable Bedding (TSB) material the data capture must include the appropriate Conductor Codes and geo spatial of the cross section.
4. To minimise the effect of mutual heating on parallel sections of mains, whenever new cable/s are installed (for parallel lengths in excess of 10m) a minimum separation of 4 meters is to be maintained from all Transmission assets (33-330 kV) and 2m is to be maintained from existing distribution mains (415V/11kV) (transverse crossings are not a significant issue), unless stated otherwise by Distribution Planning.
5. Wherever excavation is carried out, please email Engineer Standards & Communications (Tsuey Chia) at thchia@ausgrid.com.au to determine if an additional duct suitable for Fibre/Communications will be required.
6. These HV Connections are only valid for a period of 12 months from the day of issue.

There are no other special planning requirements, however should there be any further changes to the loading information, substation design or site details please e-mail Central Distribution Planning/Ausgrid (CentralDistributionPlanning@ausgrid.com.au).

Prepared By:

D Fernando Date: 18 January 2018

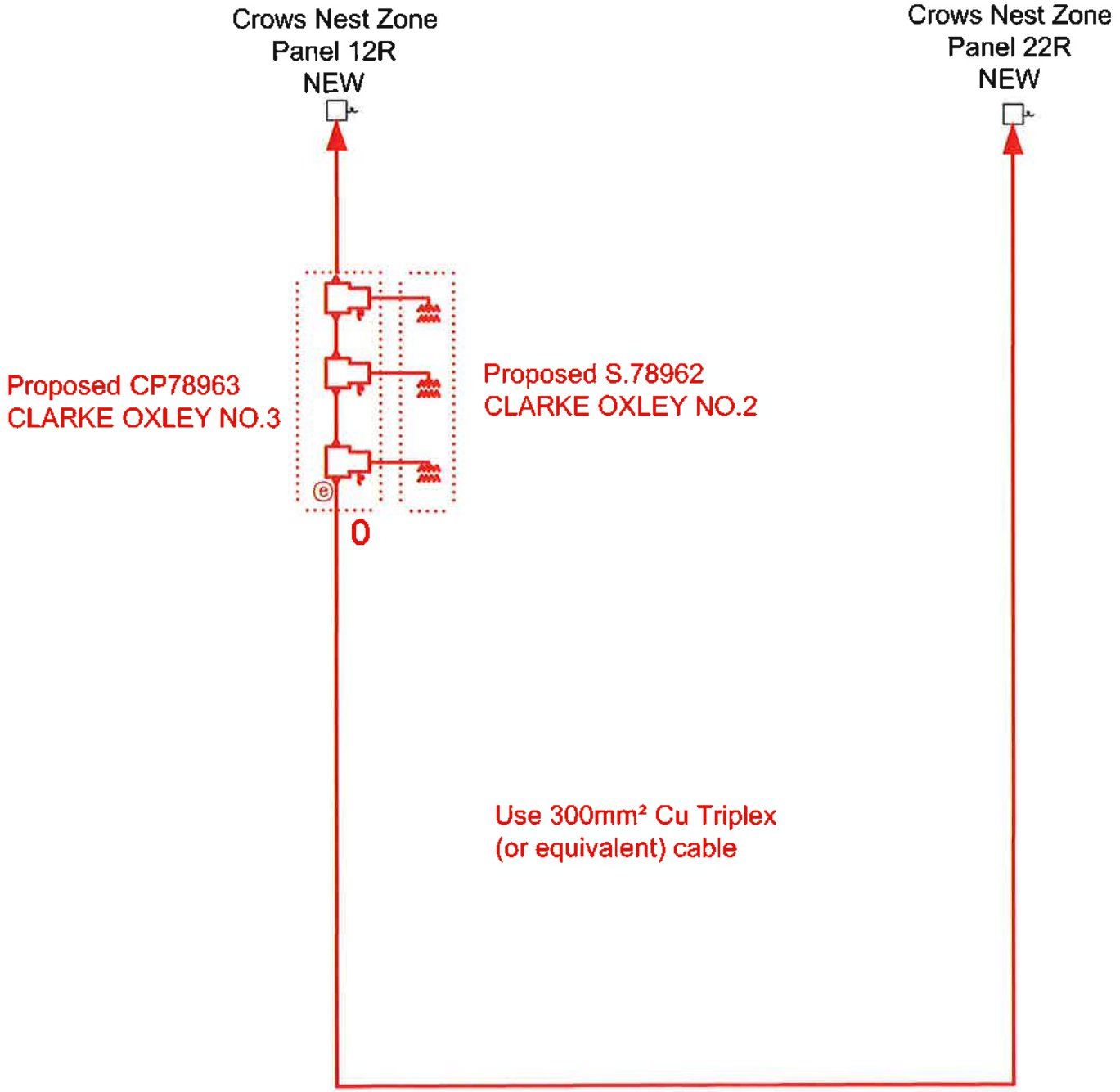
Dulakshi Fernando
Distribution Planner - Distribution Planning Central

Approved By:

A. E Date: 19/01/18

~~Charbel Estephan~~
Senior Distribution Planner - Distribution Planning Central
ANDREW TIDY (FOR CHARBEL ESTEPHAN)

PROPOSED



Ausgrid

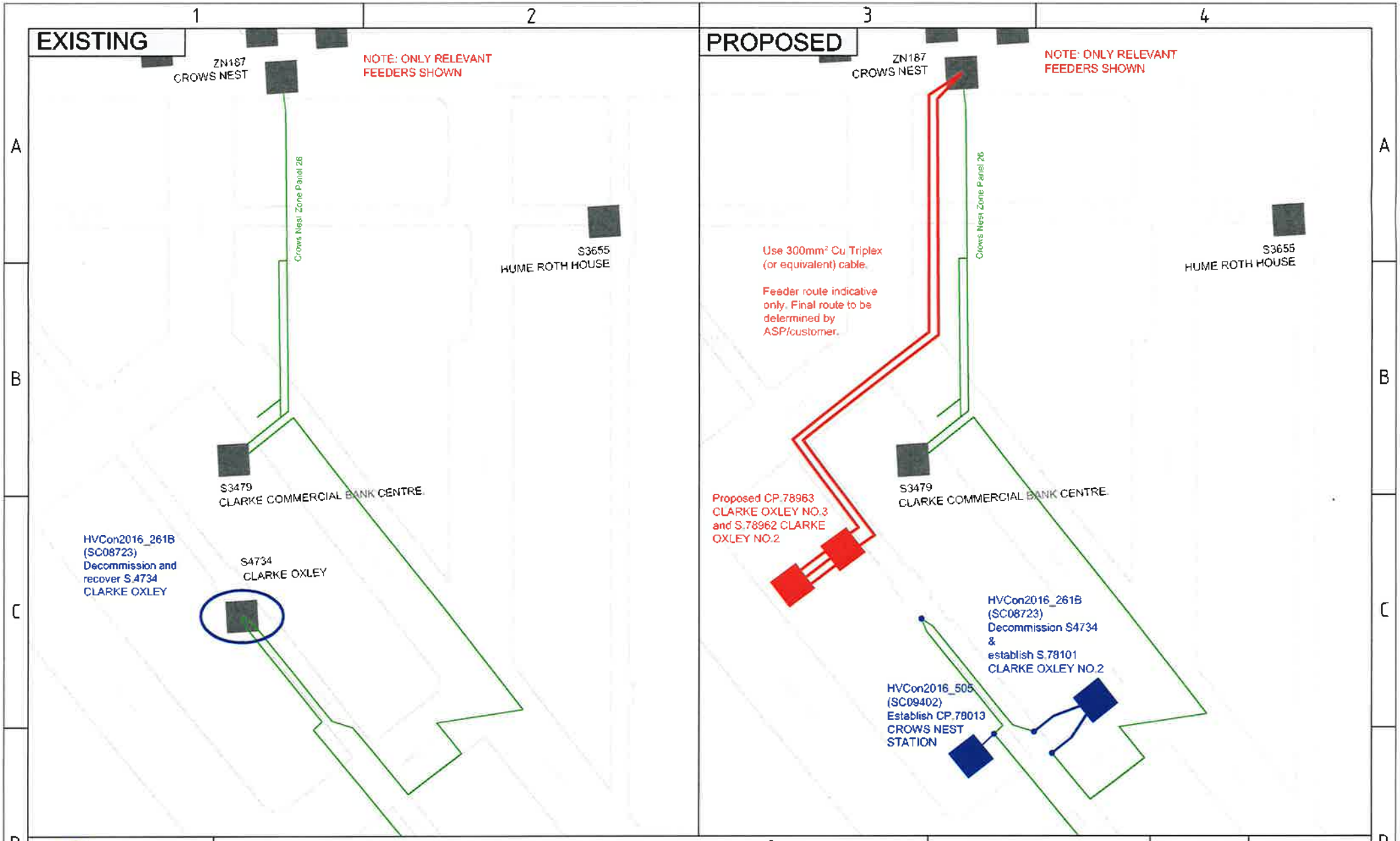
CROWS NEST STATION
DEVELOPMENT - TOWER A - NORTH - ESTABLISHMENT OF UPPER LEVEL CHAMBER SUBSTATION S.78962 CLARKE OXLEY NO.2 AND CP78963 CLARKE OXLEY NO.3

ZONE NO.11 CROWS NEST ZONE

SAP NUMBER	SC12483
PROJTRAK No.	----
18/01/2018	

A4 | DPI-2018_0018 | AMD 0

Sheet 3 of 4 Sheets



Ausgrid

CROWS NEST STATION DEVELOPMENT - TOWER A - NORTH - ESTABLISHMENT OF UPPER LEVEL CHAMBER SUBSTATION S.78962 CLARKE OXLEY NO.2 AND CP78963 CLARKE OXLEY NO.3

ZONE NO.11 CROWS NEST ZONE

SAP NUMBER	SC12483
PROJTRAK No.	----
	18/01/2018
A4 DPI-2018_0018 AMD 0	Sheet 4 of 4 Sheets

DPI 2018_0018

HVCON Request FORM

09.01.2018

To: DOR Distribution Planning
Level 6 HOB 570 George Street
Sydney NSW 2000

Email: Central Distribution Planning/Ausgrid

From: Andrew Busch
Phone: 96639340
Email: abusch@ausgrid.com.au
Building 3, 51-59 Bridge Road
Hornsby NSW 2077

iAMS Project Number:	SC12483	Date Offer Accepted:	
Project Description:	Crows Nest station development Tower A – North. Establishment of Upper level chamber S078962 'CLARKE OXLEY NO2' & CP.78963 'CLARKE OXLEY NO3'		
Project Address:	497 Pacific Hwy, Crows nest		

AFC Details	☐ HV Connection ☒ LV Connection		
Existing Load:	3 Phases	Amps	
Proposed Load:	3 Phases	4080 Amps	Residential (344 units and 10 commercial) – Part of Sydney Metro development (crows nest station)
Future Load:	3 Phases	Amps	
Total:		4080 Amps	

160A

HV Proposal	
Proposed Distribution Centre:	3 x 1500kVA Chamber substation (dry type upper level) and Control Point
Proposed POE (if applicable):	Clarke Lane Crows Nest
Proposed Zone/Feeder:	
HV Network Proposal:	
Relocation Proposal:	

LV Proposal	
LV Supply Proposal:	LV Connection of development at proposed substation(s).
LV Network Proposal:	LV Interconnection(s) from proposed substation(s) to existing network.
Relocation Proposal:	

Details of electrical equipment likely to effect others	
Motors	
Welders	
Medical Equipment	
Other	

Attachments:		
	☐ Partial copy of GIS ☐ Development Site Plan ☐ Marked up System Diagram ☒ AFC	☐ Other

Planning: Response / Comments / Recommendations

Address all relevant correspondence to:

Ausgrid Contestability Section
Building 3, 51-59 Bridge Road
Hornsby NSW 2077

E: Contestability@ausgrid.com.au

25.01.2018

Transport for NSW
Attention: Paul Rogers

Email: paul.rogers@transport.nsw.gov.au

Project Number: SC12483

Dear Paul

Electricity Network Connection Application at: 497 Pacific Highway, Crows Nest. Tower A North

The design information for this development has been prepared and forwarded electronically to your email address. Please forward the document(s) to your ASP/3 so that the design can be finalised and submitted for certification.

The design information and Contract for Design Related Services are valid for a maximum period of 12 months from the date of provision by Ausgrid. Should a design not be submitted and certified within the 12 month validity period, you may apply for an extension. Note that additional Ancillary Service Fees will apply.

You should discuss with your ASP/3 the notification requirements associated with the electrical design. Such notification periods may have an impact on the timing of your connection.

Ausgrid will only certify a submitted design prepared against the design information when all requirements of the Contract for Design Related Services are met.

Property Rights

Property rights in favour of Ausgrid are required for all new and altered and, in some instances, existing Ausgrid assets located on private property. To meet this obligation you have two options:

1. At least six (6) weeks prior to electrification of any electrical network construction works a Deed of Agreement (DoA) for Easement or Lease must be executed by all parties. Once executed, Ausgrid will place a caveat over the property. The caveat will be released upon easements being registered. Easement documents must be lodged with LPI without delay following electrification, in accordance with the DoA and Connection Contract. It is recommended that you allow at least 4 weeks for Ausgrid to execute standard Deeds of Agreements.
2. Alternatively, you may opt to lodge easements with LPI prior to electrification. In this case, two (2) weeks prior to electrification of any electrical network construction works you must provide evidence of lodgement of the property rights with LPI. If property rights are not lodged in time, the electrification will need to be rescheduled. It is recommended that you allow at least 10 weeks for Ausgrid to execute standard leases and easements.

To avoid possible delays in electrification, we recommend you proceed with Option 1 and provide a signed DoA as soon as possible.

The DoA and easement/lease documents, and directions for signing are available on our website at the following link: www.ausgrid.com.au/CDRS

Long Lead Time Items

Please note that the Connection Works potentially require items of equipment that have long lead times. Please ensure that you arrange for such item to be procured and delivered to site in a timely manner during the construction period. In general these types of items can include:

- ❑ Chamber substation transformers, high voltage and low voltage switchgear and other components.

All items used in constructing the Connection Works must be Ausgrid approved material.

What to Do Next

- ❑ Distribute the design information to ASP/3 designers for quotations if required.
- ❑ Select and arrange an ASP/3 designer to prepare and submit a compliant design to Ausgrid.
- ❑ Commence arrangements to satisfy Ausgrid's property rights requirements.

General

Standard Ausgrid documents mentioned in this letter, including those enclosed, are available on Ausgrid website *www.ausgrid.com.au*. If you do not have access to the web and would like to read any of the documents mentioned in this letter they may be obtained by contacting the phone number below.

Should you require any further information please contact me on the phone number or email address detailed below.

Yours sincerely,

Andrew Busch
Contestability Project Coordinator
Ausgrid

Direct Telephone Number: 96639340
Email: abusch@ausgrid.com.au

Encl: Design Information

Project Number: SC12497

New Chamber Substation

Tower B Crows Nest Station

Design Information

Site Specific Requirements - Complex

Date: 19.02.2018

CONTENTS

SITE SPECIFIC DESIGN INFORMATION REQUIREMENTS

The Design Information Site Specific Requirements Complex is complementary to, and must be read in conjunction with, the Design Information General Requirements, which can be found on the Ausgrid web site.

1. Ausgrid Project References

SAP Project Number	SC12497
Prjtrak Number	XCH014100

2. Ausgrid Contact Details

Note that this information is not to be placed on the design.

Ausgrid Contact	Damian Carmody
Telephone No	43998092
Email Address	dcarmody@ausgrid.com.au

3. Details of proposed Ausgrid Projects in the vicinity of Development

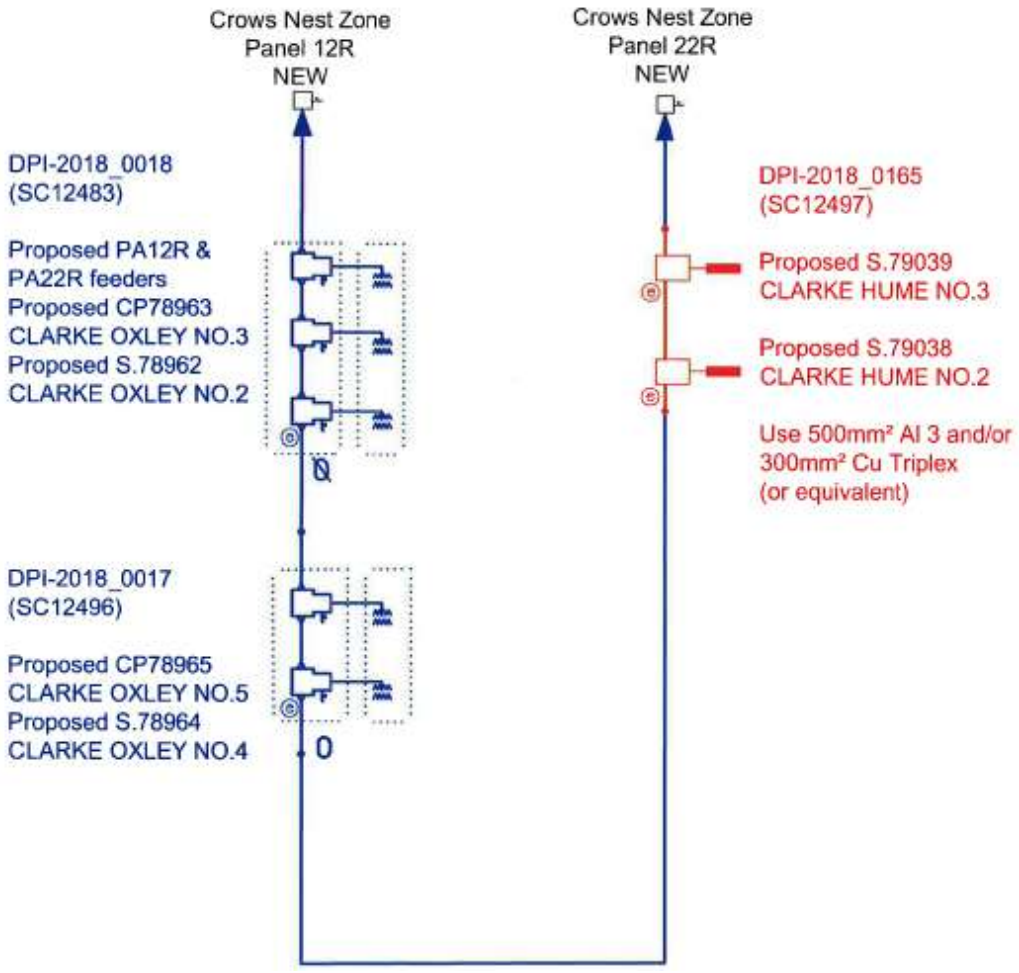
Ausgrid Projects SC12483 and SC12496 are currently in design phase. This design information is based on those projects being 100% complete.

4. Network Extension Connection Point

4.1. High Voltage Connection Point

Zone substation Crows Nest Zone No.11 - 11kV feeder: PA22R.

- Between Proposed S.78964 and Panel 22R (see below).

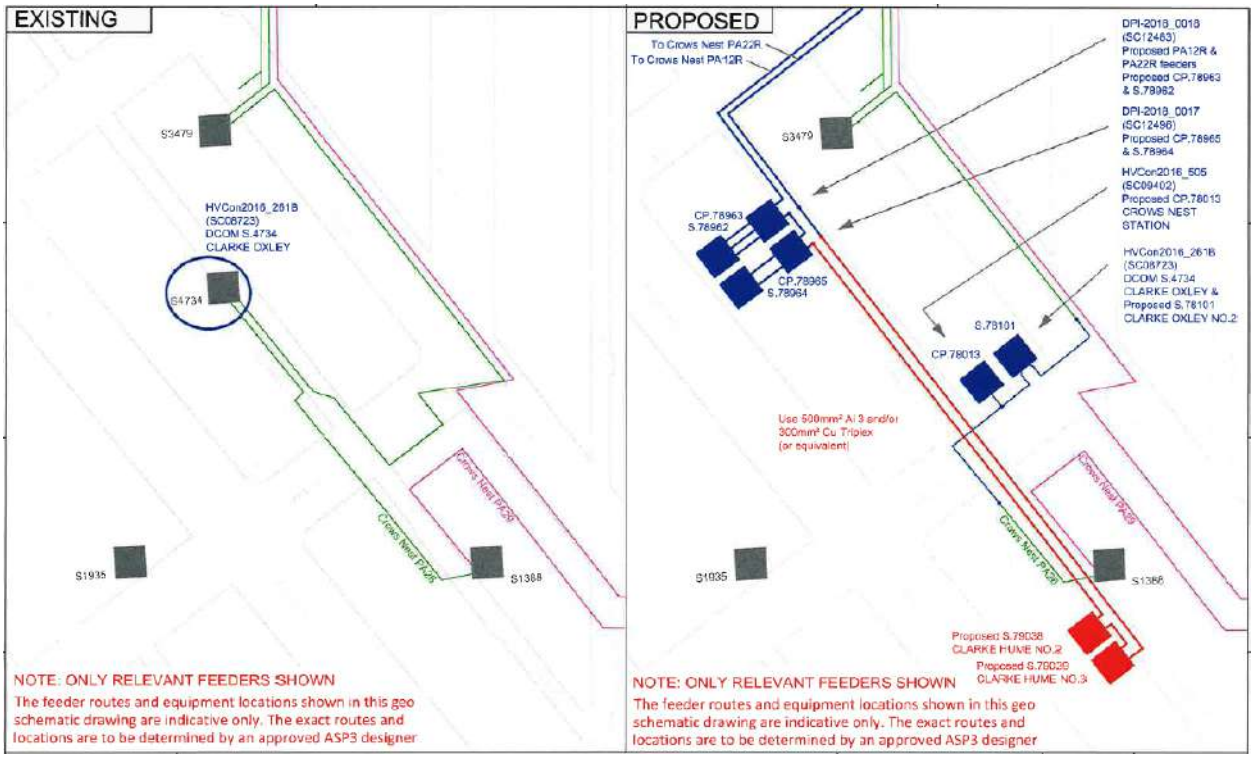


5. Details of Ausgrid Network in Vicinity of the Development

Recorded details of the Ausgrid network, including cable codes, soil codes, etc, are shown in Ausgrid's WebGIS. The ASP/3 designer must login to the WebGIS to obtain relevant information. The ASP/3 designer should contact Ausgrid for any further clarification or if information appears to be missing. Note: Ausgrid's WebGIS information has not been verified against actual site assets. The ASP/3 designer is responsible for the accuracy of information on designs and it is strongly advised that the ASP/3 designer verifies WebGIS asset details on site prior to undertaking the design.

6. Proposed Works

Alter the existing high voltage and/or low voltage network systems, in accordance with the schematic and/or graphical representation, for the required electrical works as shown on the attached and/or following drawing(s).



6.1. Extension Works

Fit out 2 x 750kVA transformer surface chamber substations that are to be constructed on the development property either within the proposed building or as a freestanding structure.

Install low voltage interconnection(s) from the proposed substation(s) to the existing low voltage Network reticulation.

7. Customer Point of Supply (Connection Point)

Provide a 1990amp three phase low voltage point of supply at the low voltage switchgear terminals within the chamber substation enclosures.

8. Fault Level

11kV node: S.79038 Clarke Hume No.2

- Existing maximum three phase 11kV fault level is 8.31kA.

9. Cable/Conductor Route and Type

9.1. Route Information

It is generally the responsibility of the ASP/3 designer to select an appropriate route. However, Ausgrid reserves the right to require variation(s) of any proposed cable route.

Ausgrid makes no warranty expressed or otherwise that any proposed route depicted in the design information by Ausgrid is suitable for the intended purpose.

9.2. Underground

11kV	11kV 500 AL3 TRXQ 35 CU(WS) ZYQ - refer to NS177 for details on cable termination requirements (ie the cable size for the transistion to single core cables). 11KV 300CU1 EPR 70 CU(WS) Z YQ / Triplex.
Low Voltage	LV 240AL4XQZ/SAC
Street Lighting	Sydney & Central Coast Area (Refer to NS112 & NS119) 16CU2 XQZ or 16CU4 XQZ
SCADA / Telecontrol	UGFO - 60 Fibre Nylon Jacketed Dry Core Cable

9.3. Conduits

Spare Conduits available for use	Unknown
Spare conduits to be laid as part of this project	one (1) spare 63mm conduit (for future optic fibre pilot cable use), is to be installed in association with all 11kV cable trenches. Minimum bank of 4 x 150mm conduits.

10. EQUIPMENT

10.1. Standard Single Transformer Surface Chamber Substation

Substation Number	S.79038	Substation Name	Clarke Hume No.2			
Type	Single 750kVA transformer surface chamber to Ausgrid Drawing 224407 or 224408					
Load Cycle	D: Mixed Predominantly Domestic	Vector Group	Dyn 1	Voltage Ratio	11000/433	
Description			Stock Code		Quantity	
Power Transformer	750kVA Oil Filled		180357		1	
HV Switchgear	ABB Safelink RMI		179642		1	
LV Board Arrangement	400/800/400/400 (181790) 400/400/400/400 (181791) 400/400/400/400/400 (181792) 400/800/400 (181793) 800/400/800 (181834) 1600/400/400 (181835)		181790 181791 181792 181793 181834 181835		1	

10.2. Standard Single Transformer Surface Chamber Substation

Substation Number	S.79039	Substation Name	Clarke Hume No.3			
Type	Single 750kVA transformer surface chamber to Ausgrid Drawing 224407 or 224408					
Load Cycle	D: Mixed Predominantly Domestic	Vector Group	Dyn 1	Voltage Ratio	11000/433	
Description			Stock Code		Quantity	
Power Transformer	750kVA Oil Filled		180357		1	
HV Switchgear	ABB Safelink RMI		179642		1	
LV Board Arrangement	400/800/400/400 (181790) 400/400/400/400 (181791) 400/400/400/400/400 (181792)		181790 181791 181792		1	

	400/800/400 (181793) 800/400/800 (181834) 1600/400/400 (181835)	181793 181834 181835	

10.2.1. Standard Single Transformer Surface Chamber Substation Equipment Fuse Element Schedule

HV Fuse	750kVA Transformer (ABB Safelink): 80amp SIBA 30.020.93
LV Fuses	LV fuse elements: 400amp 92mm centres Bell / MEM "J" LV fuse elements: 500amp 92mm centres Bell / MEM "J" LV fuse elements: 630amp 92mm centres Bell / MEM "J" LV fuse elements: 800amp 92mm centres Bell / MEM "J" LV fuse elements: 1000amp 160mm centres Alstom LV fuse elements: 1200amp 165mm centres Alstom LV fuse elements: 1600amp 160mm centres Alstom

11. Asset Number Allocation

During the design stage the ASP/3 designer will need to request from Ausgrid any additional asset numbers.

12. Apportionment of Costs

The information this section contains is based on assumptions of the likely design solution. Certification of a design that does not conform to such assumptions may require Ausgrid to reassess the apportionment of costs and funding of the project, including re-assessment of any quotations issued prior to Design Certification.

12.1. Funding

At this stage Ausgrid will fund the following works for the development and anything not listed is funded by the customer. Where applicable, the amount(s) to be paid by Ausgrid will detailed on the Schedule to the Certified Design.

- Low voltage mains components within dedicated public roadways and/or the substation property rights area(s) used for supplying Network loads and are beyond the development property as follows.
    - ~ Low voltage interconnection from proposed substation to exsting low voltage network and associated spare conduit.
- The installation of spare conduits (excluding trenching and under bores) as follows.
    - ~ The installation of the fibre optic pilot cable conduit along the high voltage cable and /or conduit route.
- Trenching for the installation of Ausgrid funded cable or conduit installations that have only Ausgrid funded components installed.

13. Design Information Attachments

The following documentation is readily available and can be found on our website www.ausgrid.com.au

- Design Information – General Terms and Conditions document.
- Ausgrid's external CAD design template.
- Design Certification Check Sheet.
- Asset Number Request Spreadsheet.
- Asset Valuation Spreadsheet (AVS).
- Street Lighting Acceptance Form(s).
- Network Earthing Information Sheet.

The following can only be obtained from the Ausgrid WebGIS portal.

- A translated GIS extract of the proposed work area in DWG format (includes soil codes).

- Relevant additional asset information including cable codes.
- Relevant system diagram(s). NOTE – Loads and ratings shown on system diagrams is for internal Ausgrid use only.
- Environmental Analysis report.

The ASP/3 designer intending to undertake the design must obtain and use the electronic format of the relevant design information attachments (refer to NS104).

14. Notations to be placed on Design

In addition to the standard notations on the attached CAD design template add the following notations.

- The ASP/1 is required to comply with the correct procedure(s) for working with and/or near asbestos material (refer to Ausgrid NUS 211 – Working with Asbestos Products).

15. Remarks / Other Comments

The ASP/3 designer needs to contact Ausgrid early in the design phase should any of the proposed works require an alteration and/or extension to the Ausgrid fibre optic network. Ausgrid will then advise the ASP/3 designer of the scope of fibre optic network works that needs to be undertaken by Ausgrid and the works that will need to be done by the ASP/1. Generally Ausgrid only undertakes the final terminations and commissioning of the fibre optic network installation, however, the fibre optic network design and funding review is undertaken on a case by case basis.

The following table specifies LV link usage and link asset numbering requirements.

LV1-61 K & N switch pillar: usage	Link numbers required on Design	Link numbers required in Field
Not Permitted	Yes: but only normally open LV links within single and double link switch pillars are allocated an additional asset number for the link(s).	Yes: but only normally open LV links within single and double link switch pillars are allocated an additional asset number for the link(s).

Any LV underground to overhead transition points that connect directly to a chamber substation (ie the first LV network connection on the LV distributor cable) requires the installation of pole mounted LV links.

Low voltage pillars (new or altered) within Commercial areas must comply with NS224 unless a written variation is agreed with Ausgrid.

Please consult your Contestable Project Coordinator for approval prior to the use of 11kV high voltage stub tee joints (HV3-43) on this project.

16. Design Information Revision History

19.02.2018	Initial issue using template version v180205

Address all relevant correspondence to:

Ausgrid Contestability Section
Building 3, 51-59 Bridge Road
Hornsby NSW 2077

E: Contestability@ausgrid.com.au

19 February 2018

Transport for NSW
Attention: Paul Rogers

Email: paul.rogers@transport.nsw.gov.au

Project Number: SC12497

Dear Paul

Electricity Network Connection Application at: 497 Pacific Hwy, Crows Nest. Tower B.

The design information for this development has been prepared and forwarded electronically to your email address. Please forward the document(s) to your ASP/3 so that the design can be finalised and submitted for certification.

The design information and Contract for Design Related Services are valid for a maximum period of 12 months from the date of provision by Ausgrid. Should a design not be submitted and certified within the 12 month validity period, you may apply for an extension. Note that additional Ancillary Service Fees will apply.

You should discuss with your ASP/3 the notification requirements associated with the electrical design. Such notification periods may have an impact on the timing of your connection.

Ausgrid will only certify a submitted design prepared against the design information when all requirements of the Contract for Design Related Services are met.

Property Rights

Property rights in favour of Ausgrid are required for all new and altered and, in some instances, existing Ausgrid assets located on private property. To meet this obligation you have two options:

1. At least six (6) weeks prior to electrification of any electrical network construction works a Deed of Agreement (DoA) for Easement or Lease must be executed by all parties. Once executed, Ausgrid will place a caveat over the property. The caveat will be released upon easements being registered. Easement documents must be lodged with LPI without delay following electrification, in accordance with the DoA and Connection Contract. It is recommended that you allow at least 4 weeks for Ausgrid to execute standard Deeds of Agreements.
2. Alternatively, you may opt to lodge easements with LPI prior to electrification. In this case, two (2) weeks prior to electrification of any electrical network construction works you must provide evidence of lodgement of the property rights with LPI. If property rights are not lodged in time, the electrification will need to be rescheduled. It is recommended that you allow at least 10 weeks for Ausgrid to execute standard leases and easements.

To avoid possible delays in electrification, we recommend you proceed with Option 1 and provide a signed DoA as soon as possible.

The DoA and easement/lease documents, and directions for signing are available on our website at the following link: www.ausgrid.com.au/CDRS

Long Lead Time Items

Please note that the Connection Works potentially require items of equipment that have long lead times. Please ensure that you arrange for such item to be procured and delivered to site in a timely manner during the construction period. In general these types of items can include:

- ❑ Kiosk and pole mounted substations.
- ❑ Chamber substation transformers, high voltage and low voltage switchgear and other components.
- ❑ Intelliruptors.

All items used in constructing the Connection Works must be Ausgrid approved material.

What to Do Next

- ❑ Distribute the design information to ASP/3 designers for quotations if required.
- ❑ Select and arrange an ASP/3 designer to prepare and submit a compliant design to Ausgrid.
- ❑ Commence arrangements to satisfy Ausgrid's property rights requirements.

General

Standard Ausgrid documents mentioned in this letter, including those enclosed, are available on Ausgrid website *www.ausgrid.com.au*. If you do not have access to the web and would like to read any of the documents mentioned in this letter they may be obtained by contacting the phone number below.

Should you require any further information please contact me on the phone number or email address detailed below.

Yours sincerely,

Damian Carmody
Contestability Project Coordinator
Ausgrid

Direct Telephone Number: 43998092
Email: dcarmody@ausgrid.com.au

Encl: Design Information

DPI2018_0165 Project Number: SC12497

16 February 2018

Sent To: Distribution Planning Manager (Mark Appleton)/
Negotiating Officer – Contestable Connection (Damian Carmody)

Copy to: Branch File 342.11 General (Crows Nest Zone)

PREFERRED POINT OF ENTRY AND HIGH VOLTAGE CONNECTION FOR THE ESTABLISHMENT OF THE CUSTOMER SUBSTATIONS S.79038 CLARKE HUME NO.2 AND S.79039 CLARKE HUME NO.3, 497 PACIFIC HWY, CROWS NEST.

Following is a reply to your request dated 13 February 2018 and subsequent correspondence requesting the Preferred Point of Entry and HV connections for the above project.

PREFERRED POINT OF ENTRY
N/A

ASSOCIATED PROJECTS
THE CONNECTIVITY SHOWN IN THE ATTACHED DIAGRAMS INCLUDES PROPOSED WORKS UNDER HVCON2016_261B (SC08723) AND HVCON2016_505 (SC09402). HOWEVER, THIS HV CONNECTION IS NOT DEPENDENT ON THE COMPLETION OF THESE WORKS.

THE CONNECTIVITY SHOWN IN THE ATTACHED DIAGRAMS INCLUDES PROPOSED WORKS UNDER DPI-2018_0017 (SC12496) AND DPI-2018_0018 (SC12483). THIS HV CONNECTION IS DEPENDENT ON THE COMPLETION OF THESE WORKS.

HV CONNECTIONS
1) Refer to attached drawings.

2) Use 500mm^2 Al 3 or 300mm^2 Cu Triplex cable (or equivalent).

3) Where performing trenching works, install an ultimate 4 x 150mm duct bank for HV use. If any of these ducts are expected to be used for LV purposes, please contact the Distribution Planner to determine the optimal duct bank size.

VOLTAGE DROPS AND NOMINAL 3 PHASE FAULT LEVELS S.79038 CLARKE HUME NO.2
1) Assuming a source three phase Fault Level on the TX11 11kV group busbar at Crows Nest zone substation of 8.84kA, the three phase fault level* on the HV side of the proposed S.79038 CLARKE HUME NO.2 is anticipated to be 8.31kA.

2) Assuming a maximum voltage level on the TX11 11kV group busbar at Crows Nest zone substation of 10.55kV, the voltage level* at the proposed S.79038 CLARKE HUME NO.2 is anticipated to be 10.55kV(0%VD).

VOLTAGE DROPS AND NOMINAL 3 PHASE FAULT LEVELS S.79039 CLARKE HUME NO.3.
1) Assuming a source three phase Fault Level on the TX11 11kV group busbar at Crows Nest zone substation of 8.84kA, the three phase fault level* on the HV side of the proposed S.79039 CLARKE HUME NO.3. is anticipated to be 8.33kA.

2) Assuming a maximum voltage level on the TX11 11kV group busbar at Crows Nest zone substation of 10.55kV, the voltage level* at the proposed S.79039 CLARKE HUME NO.3. is anticipated to be 10.55kV(0%VD).

*Please note this data is NOMINAL, and for a NORMAL network configuration. It is based on the current data in the GIS, and on the 11kV Busbar fault information provided by Subtransmission Planning. The actual Voltage Drop and 3 Phase Fault Levels may differ (for example) due to network switching, paralleling of Transformers, the effects of future projects, Transformer tap settings, and the currency / accuracy of the GIS data and the 11kV busbar fault level provided. The Fault Level is not the minimum Fault Level for equipment ratings. See NS-114 (Chamber Substations), NS-117 (Kiosks Substations), NS-122 (Pole Mounted Substation) and also refer to "Clause 1.16.4 and 7.5.4" of the New South Wales Service and Installation Rules dated June 2015 Amendment November 2016 for further information.

Notes:-

1. Where single core cables are to be installed for lengths greater than 10 metres, always use bundled single core cables ie.Triplex, unless stated otherwise by Distribution Planning.
2. Conduit banks containing six or more power cable conduits (for use at any voltage level) must be installed as per the TSB requirements as per Section 12.9 of NS130.
3. When cables are installed in Thermally Stable Bedding (TSB) material the data capture must include the appropriate Conductor Codes and geo spatial of the cross section.
4. To minimise the effect of mutual heating on parallel sections of mains, whenever new cable/s are installed (for parallel lengths in excess of 10m) a minimum separation of 4 meters is to be maintained from all Transmission assets (33-330 kV) and 2m is to be maintained from existing distribution mains (415V/11kV) (transverse crossings are not a significant issue), unless stated otherwise by Distribution Planning.
5. Wherever excavation is carried out, please email Engineer Standards & Communications (Tsuey Chia) at thchia@ausgrid.com.au to determine if an additional duct suitable for Fibre/Communications will be required.
6. These HV Connections are only valid for a period of 12 months from the day of issue.

There are no other special planning requirements, however should there be any further changes to the loading information, substation design or site details please e-mail Central Distribution Planning/Ausgrid (CentralDistributionPlanning@ausgrid.com.au).

Prepared By:

Date: 16 February 2018

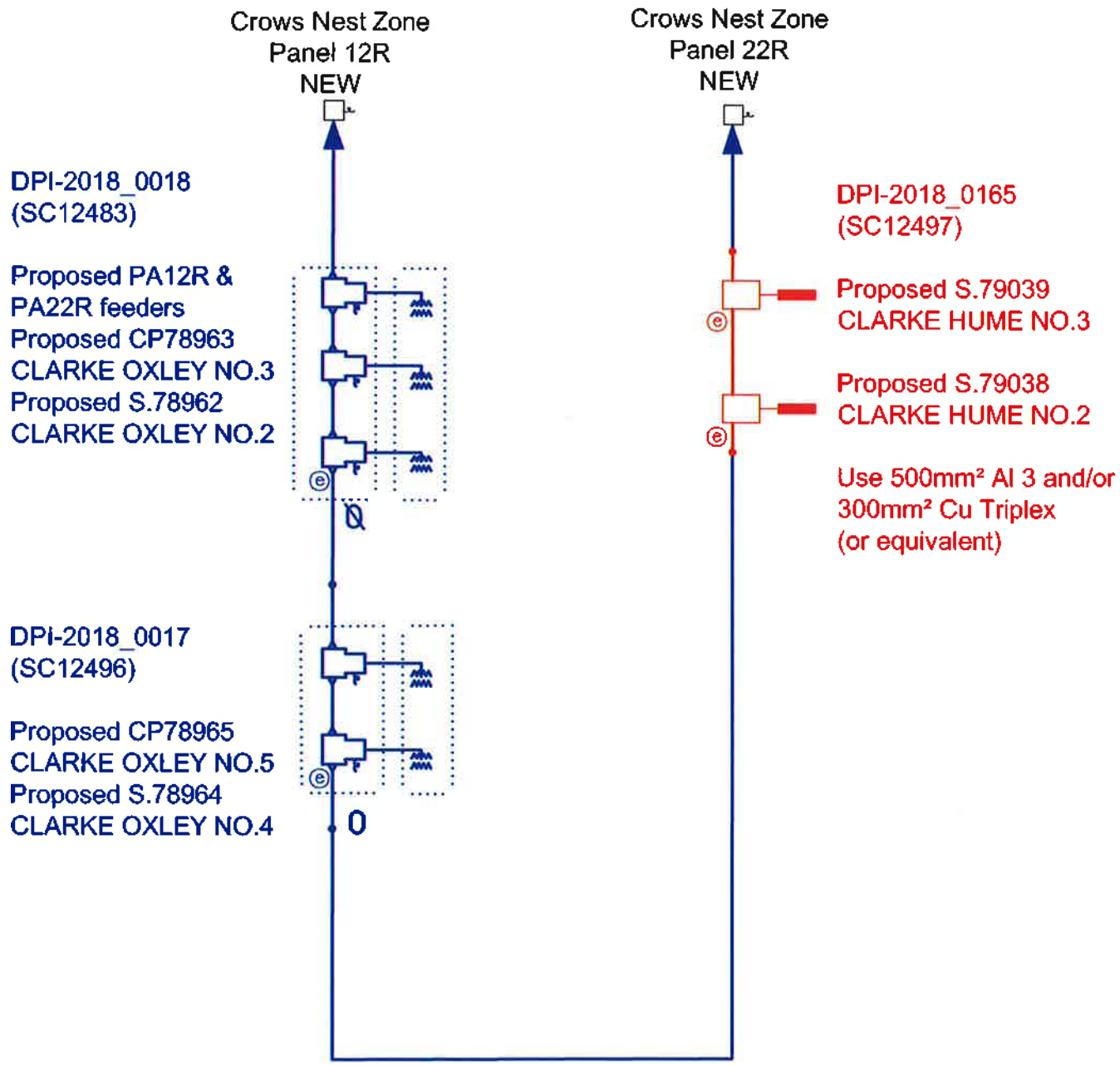
Scott Coram
Distribution Planner - Distribution Planning Central

Approved By:

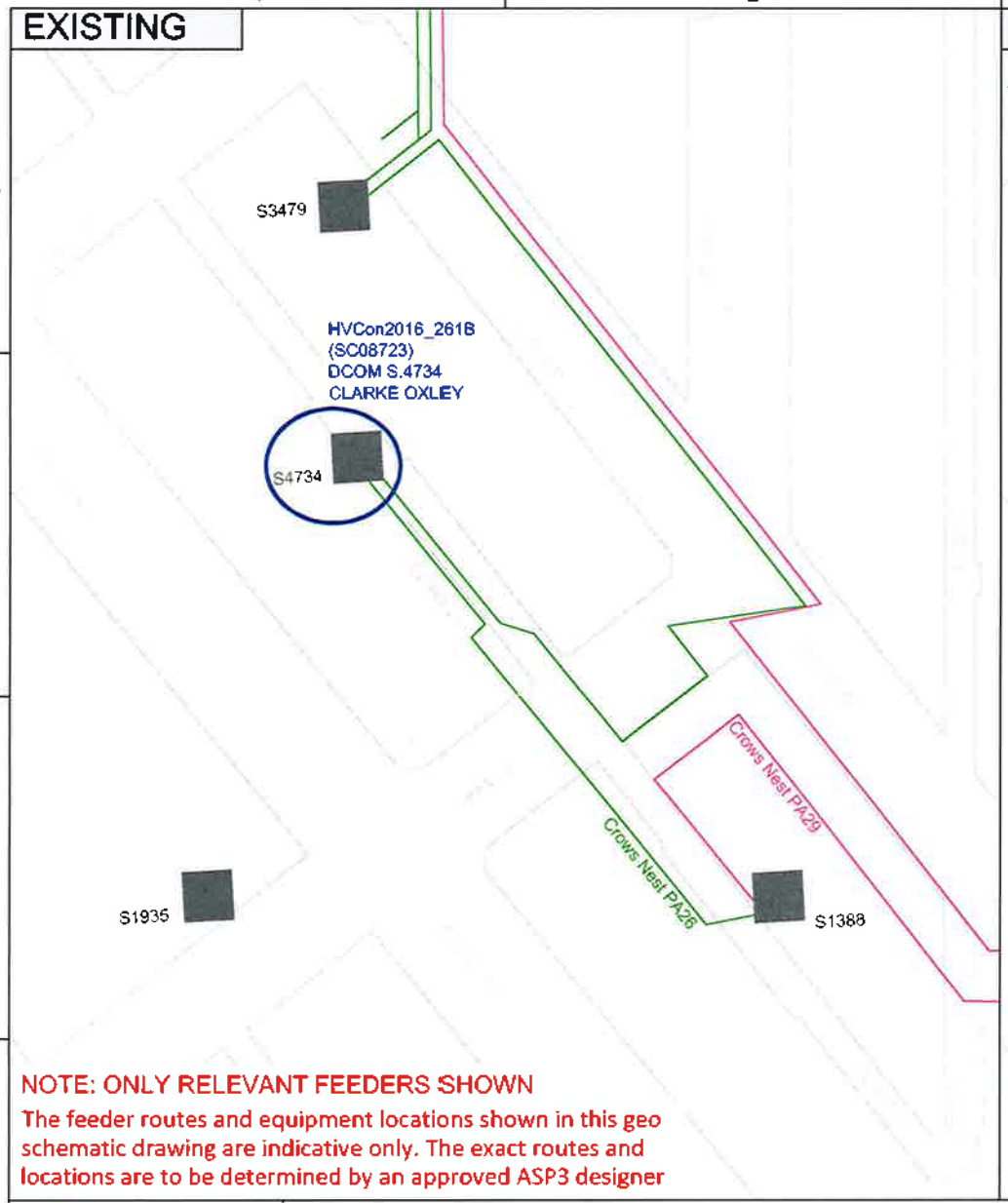
Date: 16/02/18

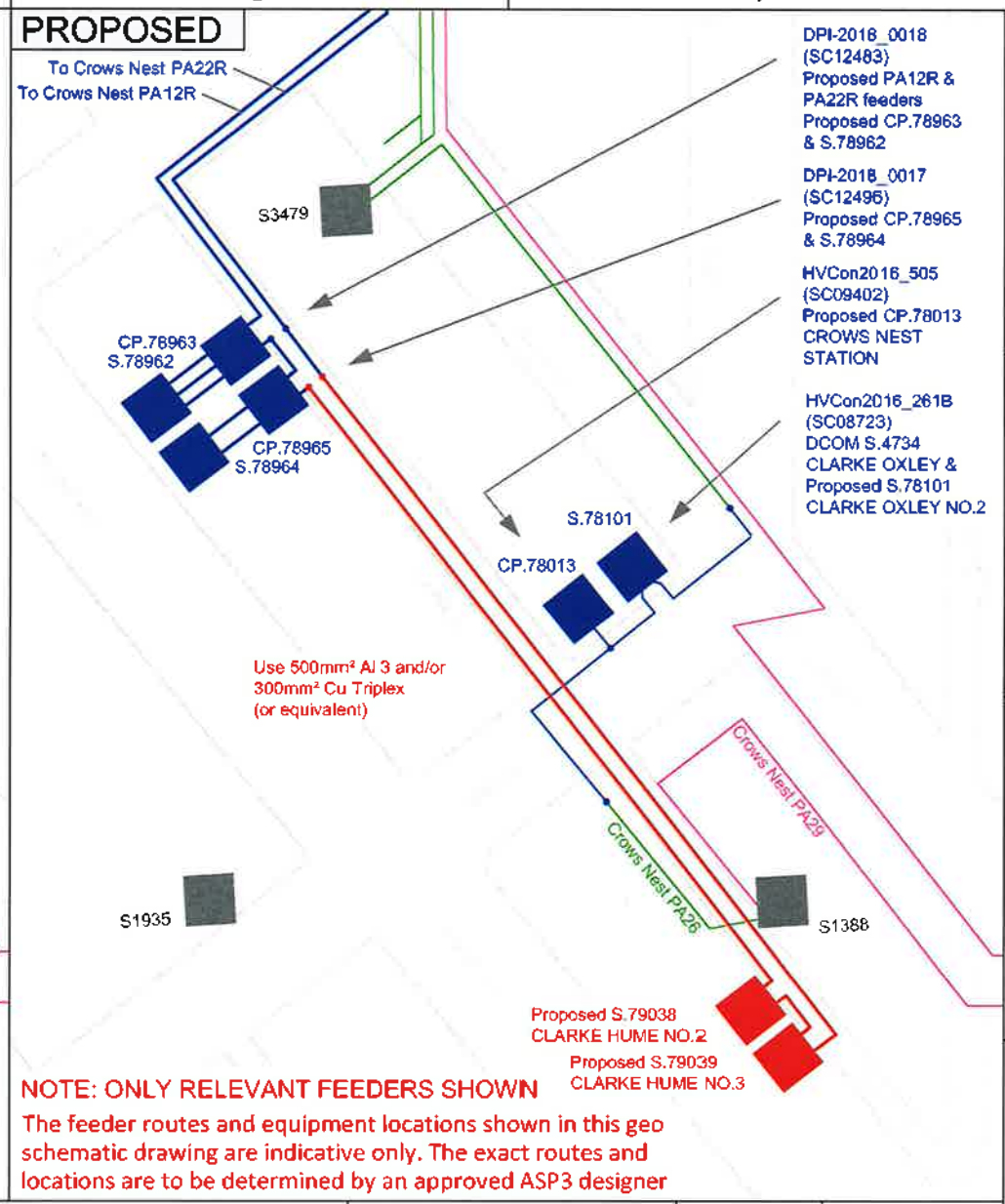
Charbel Estephan
Senior Distribution Planner - Distribution Planning Central

PROPOSED



Ausgrid	CROWS NEST STATION DEVELOPMENT TOWER B - ESTABLISH S.79038 CLARKE HUME NO.2 & S.79039 CLARKE HUME NO.3	CROWS NEST ZONE NO.11 PA22R	SAP NUMBER: SC12497
			PROJTRAK No.: ----
			16/02/2018
		A4 DPI-2018_0165 AMD 0	Sheet 3 of 4 Sheets





NOTE: ONLY RELEVANT FEEDERS SHOWN

The feeder routes and equipment locations shown in this geo schematic drawing are indicative only. The exact routes and locations are to be determined by an approved ASP3 designer

NOTE: ONLY RELEVANT FEEDERS SHOWN

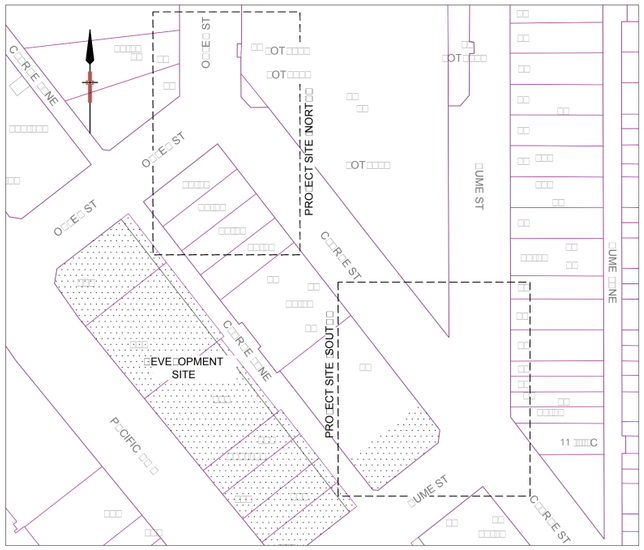
The feeder routes and equipment locations shown in this geo schematic drawing are indicative only. The exact routes and locations are to be determined by an approved ASP3 designer

Ausgrid

CROWS NEST STATION DEVELOPMENT TOWER B - ESTABLISH S.79038 CLARKE HUME NO.2 & S.79039 CLARKE HUME NO.3

CROWS NEST ZONE NO.11 PA22R

SAP NUMBER	SC12497
PROJTRAK No.	----
	16/02/2018
A4 DPI-2018_0165 AMD 0	Sheet 4 of 4 Sheets



LOCALITY MAP
NOT TO SC□□E

NOTES

□□ T□IS □R□□ ING IS TO □E RE□□ IN CON□UNCTION □ IT□ □USGRI□S NET□ OR□ ST□N□□R□S□

□□ □CCRE□ITE□ □ESIGNER IS TO □E CONT□CTE□ REG□R□ING ISSUES R□ISE□ □ IT□ T□IS □ESIGN□UE□ E□ECTRIC□□ C□N □E CONT□CTE□ □□ P□ONE ON□□□ □□□□ □□□□OR □□ F□□□□□ □□□□ □□□□

□□ C□□IMS FOR V□RI□TIONS TO T□E COST OF NON□CONTEST□□□E □ OR□S□INC□U□ING ROC□ E□C□V□TION□□ I□□ NOT □E □CCEPTE□ UN□ESS VERIFIE□ ON SITE □□ T□E □USGRI□ □ □I□E T□E □ OR□S □RE IN PROGRESS□

□□ T□E □SP□□IS RESPONSI□□E FOR UN□ERT□□ING S□TISF□CTOR□ CONSU□T□TION □ IT□ □□□□OC□□CUSTOMERS □ □O M□□ POTENTI□□□□ □E □FFECTE□ □□ T□E CONSTRUCTION □ OR□S INC□U□ING □□□ □□TER□TIONS TO SERVICE M□INS□

□□ T□E □SP□□ MUST MINIMISE T□E IMP□CT OF T□E □ OR□S ON T□E E□ECTRICIT□ SUPP□□ TO CUSTOMERS □N□ INTERRUPTIONS TO SUPP□□ MUST □E □VOI□E□ □ □ERE EVER POSSI□□E□□T □E□ST FOUR □□C□E□R □USINESS □□□S NOTICE MUST □E PROVI□E□ TO □□□ □FFECTE□ CUSTOMERS PRIOR TO □N□ P□□NNE□ INTERRUPTIONS TO T□E E□ECTRICIT□ SUPP□□□NOTICE MUST □E IN □ RITING IN □CCOR□□NCE □ IT□ C□□USE □□ OF T□E N□TION□□ ENERG□ RET□I□ RU□ES□

□□ SPECIFIC PRIOR □PPROV□□ MUST □E SOUG□T FROM □USGRI□ FOR □N□ P□□NNE□ E□ECTRICIT□ SUPP□□ INTERRUPTIONS □ □ERE T□E P□□NNE□ INTERRUPTION □ I□□E□CEE□ ONE □□□□OUR IN □UR□TION OR T□E □UR□TION □ I□□ E □ESS T□□N ONE □OUR□□UT □ SUIT□□□E TIME FOR T□E INTERRUPTION C□NNOT □E MUTU□□□□ □GREE□ TO □ IT□ T□E □FFECTE□ CUSTOMER□S□□

□□ T□E □SP□□IS TO M□INT□IN □□E□U□TE PU□□IC □G□TING □EVE□S FOR T□E □UR□TION OF T□E □ OR□S □IF NECESS□R□□T□E □SP□□ IS TO □RR□NGE FOR SUIT□□□E TEMPOR□R□ STREET □G□TING TO □E PROVI□E□ UNTI□ PERM□NENT □G□TING IS RE□EST□□□IS□E□□

□□ T□E □SP□□IS RE□UIRE□ TO COMP□□ □ IT□ T□E CORRECT PROCE□URE□S□FOR □ OR□ING □ IT□ □N□□OR NE□R □S□ESTOS M□TERI□□ □RE FER TO □USGRI□ NUS□□□ □□ OR□ING □ IT□ □S□ESTOS PRO□UCTS□□

□□ □EVE□□ □SP IS TO CONT□CT □I□□ □EFORE □OU □IG ON □□□□ □T □E□ST T□ O □□□S PRIOR TO COMMENCEMENT OF □ OR□S□□□□SERVICES □□□CENT TO E□C□V□TIONS □RE TO □E □OC□TE□ □N□ I□ENTIFIE□ PRIOR TO E□C□V□TION□

□□□ □□□ FOOTP□T□ □N□ RO□□ E□C□V□TIONS □RE TO □E RESTORE□ TO □OC□□ GOVERNMENT OR □UT□ORIT□ □IRECTION□ CONT□CT □OC□□ GOVERNMENT OR □UT□ORIT□ PRIOR TO T□E COMMENCEMENT OF CONSTRUCTION □ OR□S□

□□□ □□□ □EVE□ □ □SP □ OR□ □EPICTE□ ON T□IS □R□□ ING IS S□O□ N FOR INFORM□TION PURPOSES ON□□ □N□ □OES NOT FORM P□RT OF T□E CERTIFIE□ □ESIGN□

12. THIS INFORMATION INCLUDES DATA FROM THE NSW DIGITAL CADASTRAL DATABASE BY LAND AND PROPERTY INFORMATION © 2016, USED UNDER CREATIVE COMMONS LICENCE VERSION 4.0.

□□□FOR I□ENTIFIC□TION □N□ □OINTING PURPOSES□□□ C□□□E EN□S S□□□□ □E □□□E□□E□ □T T□E TERMIN□TION □OC□TIONS □N□ IN □OINT □□□S □URING C□□□E INST□□□□TION□T□E C□□□ES MUST □E □□□E□□E□ □S PER CERTIFIE□ □ESIGN □R□□ ING□

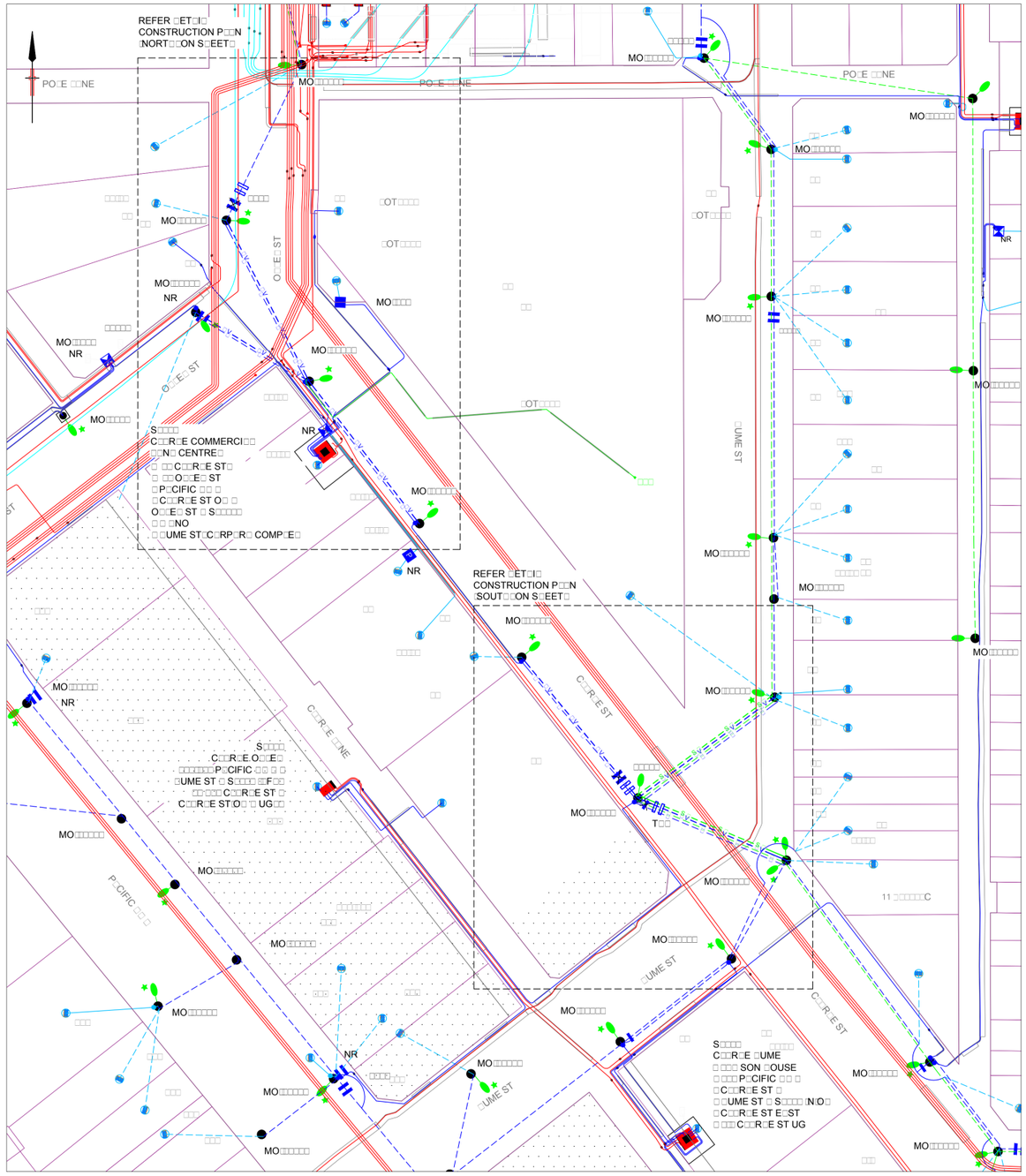
□ □RNING

□□ T□IS □R□□ ING C□NNOT □E USE□ FOR CONSTRUCTION PURPOSES UNTI□ T□E □OC□TION OF □□□E□ISTING SERVICES IS VERIFIE□□

□□ T□E □SP□□IS C□UTIONE□ □G□INST POTENT□I□□□ □□□□R□OUS PO□E TOP □O□□ C□□NGES T□□T M□□ OCCUR □URING T□E CONSTRUCTION OF T□IS PRO□ECT□CONSI□ER□TION MUST □E GIVEN TO T□E SUPPORTING OF PO□ES PRIOR TO T□E □ OR□ □EING C□RRIE□ OUT□

LEGEND

	PROPOSE□	E□ISTING		PROPOSE□	E□ISTING		PROPOSE□		E□ISTING		REMOVE	
P□□□	○	●	P□□□□□ □□ r□□ □□□d		●	C□□d □□□						
S□□S□□□d□rd	◎	◉	US□□	▯▯	▮▮	O□ □□□□□	UG C□□□□	O□ □□□□	UG C□□□□	O□ □□□□	UG C□□□□	
P□□□r S□□□d□rd	⊘	⊘	□□S	◁	◀	-HV	-HV			-X	-X	
□V P□□□r	□	■	I□T	▯	▮	-LV	-LV			-X	-X	
□V □□□□ P□□□r	⊠	⊠	□□□□S□□	▭	▬	-SL	-SL			-X	-X	
S□r□□□□□□□	⬭	⬬	C□□□ □□r S□□	◩	◪	-SV	-SV			-X	-X	
S□r□□□□□□PEC	⬭	⬬	P□□□ S□□	◔	◕	-TR132	-TR132			-X	-X	
S□r□□□□□□r□□□□□□ □□□		⬬	T□□ P□□□ S□□	⋈	⋈	-TR33	-TR33			-X	-X	
UGO□ □r R□□r	○	●	S□□□d E□d	◁	◀	-AUX	-AUX			-X	-X	
P□□E□d	◁	◀	C□□□□ T□r□ □□□□□□	◁	◀	-E	-E			-X	-X	
□□□□□	⬭	⬬	□□□□□r□ □□□□	○	●	E□r□□□□ E□□□r□d□						
□V □□□□	○	●	C□□□□ □□ □□r□□ □□□d		✖							
□V Tr□□□□	⁂	▲	O□□□ P□□□	□	□							
□V □□□□	○	●	Su□vey M□□									
S□ □□□□	○	●	PEC	☆	★							
I□□□ □□ □□ R□□ □□□d	□											



□NOT □□□ □USGRI□ □SSETS □RE NOT S□O□ N FOR C□□RIT□□

CONSTRUCTION PLAN
SC□□E □□□□□

SCALE 1 : 500
0 10 20 30 40 50 METRES

C□EC□ FOR OT□ER SERVICES □EFORE □ORING OR E□C□V□TING

CAD DRAWING □□□
AMENDMENTS

ASSOCIATED DRAWINGS

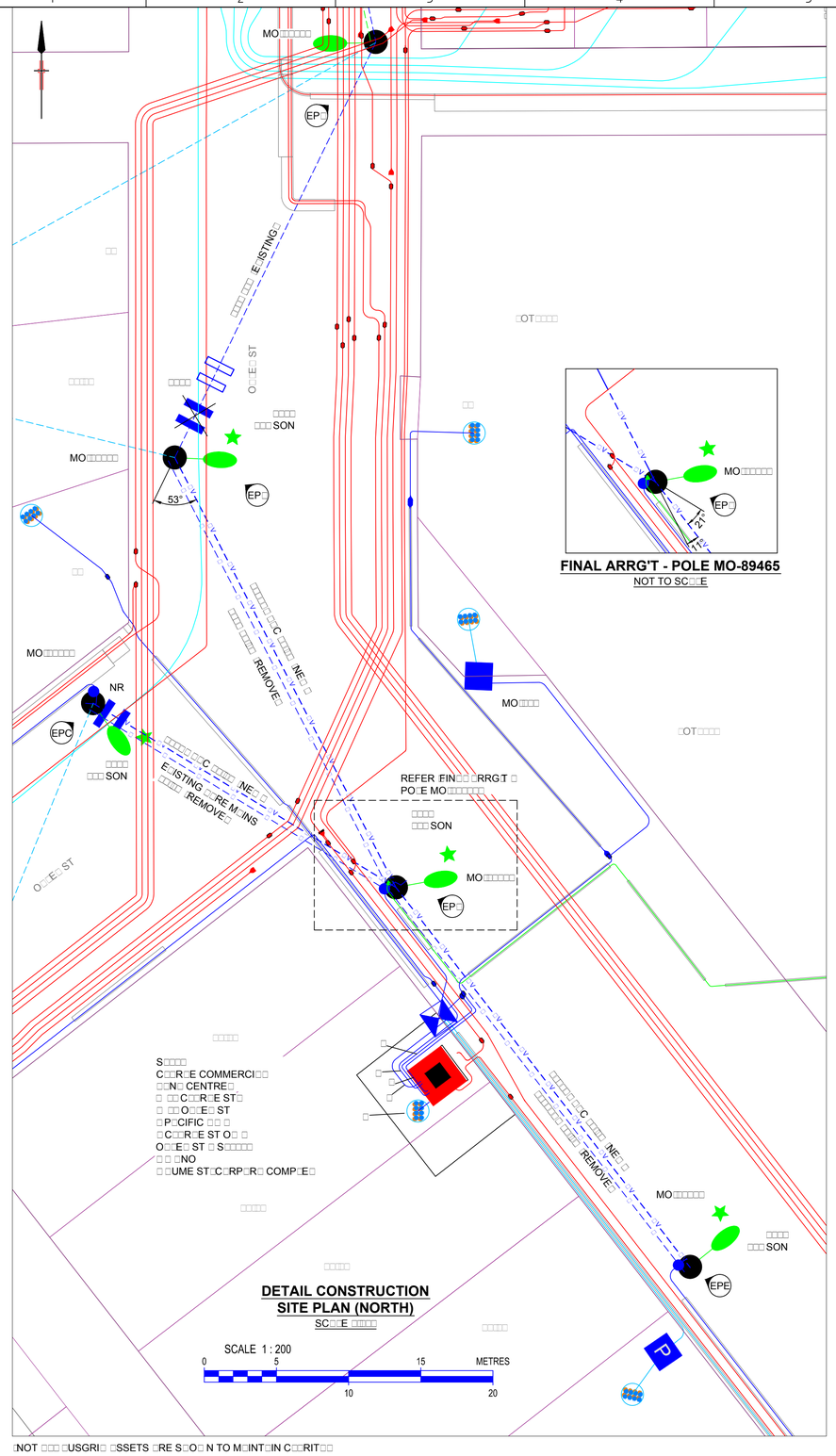
PREPARED BY:
□□□ □□□□□□□□ □□□

DESIGNED BY	PETER □IONG
AUTH NO.	□□□□□□□
SUBMIT DATE	SU□MITTE□ □□□□□□□□□
LGA	NORT□ S□□NE□ COUNCI□
MAP REF.	□□□F□□
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□□
ASP REF.	□□□□□□ □□□□□□□□
CERTIFICATION NUMBER	1050015/20170411

NET□ OR□ O□ □UGMENT□TIONS S□□NE□ METRO CRO□ S NEST ST□TION SITE C□□R□E STREET CRO□ S NEST

SIZE	AUSGRID PROJECT No.	SHEETS	AMD
A1	SC09547	1 of 5	0

2□□□8:7



DETAIL CONSTRUCTION SITE PLAN (NORTH)

SC□□E □□□□

SCALE 1 : 200

0 5 10 15 20 METRES

DETAIL CONSTRUCTION SITE PLAN (SOUTH)

SC□□E □□□□

SCALE 1 : 200

0 5 10 15 20 METRES

□NOT □□□ □USGRI□ □SSETS □RE S□O□ N TO M□INT□IN C□□RIT□□

CAD DRAWING

AMENDMENTS

ASSOCIATED DRAWINGS

PREPARED BY:

UEA

DESIGNED BY	PETER □IONG
AUTH NO.	□□□□□□□
SUBMIT DATE	SUBMITTED □□□□□□□□□□
LGA	NORTH SYDNEY COUNCIL
MAP REF.	□□□ F□□
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□□□
ASP REF.	□□□□□□□ □□□□□□□□□□

CERTIFICATION NUMBER 1050015/20170411

NETWORK OF AUGMENTATIONS
SYDNEY METRO
CROWS NEST STATION SITE
CLARKE STREET
CROWS NEST

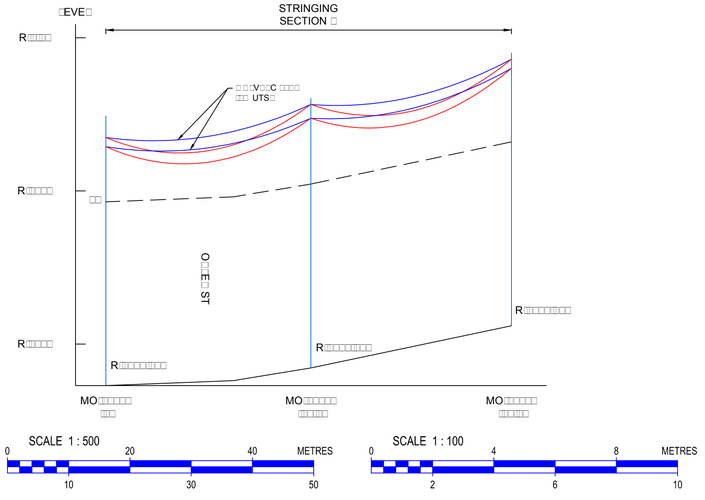
SIZE □□

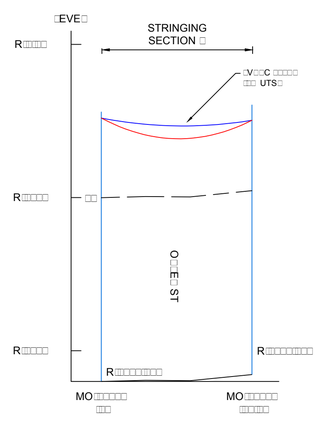
AUSGRID PROJECT No. SC□□□□□

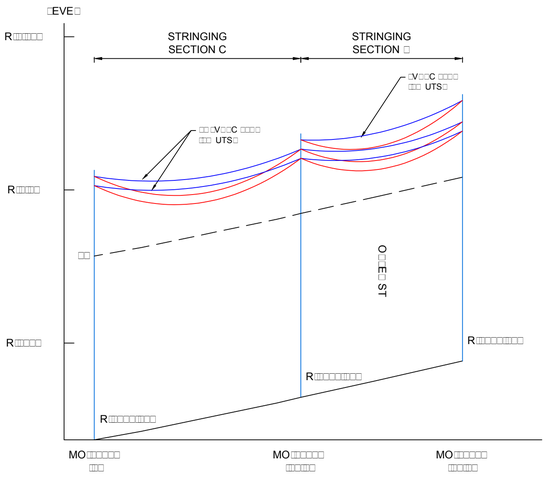
SHEETS □ of □

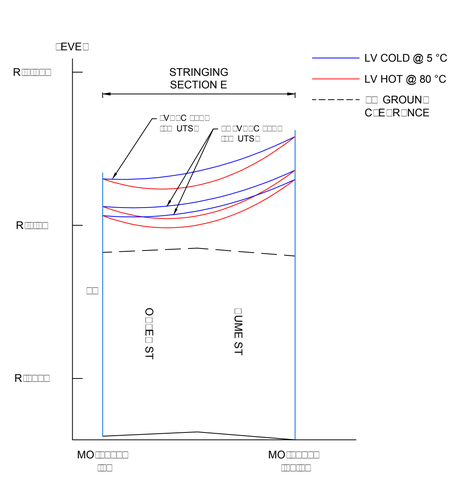
AMD. □

©









OVERHEAD CONSTRUCTION WORKS SCHEDULE *(Poles 'n' Wires Version 7)*

REF□ I□ENTIFIER	PO□E NUM□ER	SI□E □□ □	STRENGT□ □N□	PO□E T□PE TIM□ER□CONC	□EPT□ □□ □	FOOTING □ET□I□S	□V CONSTRUCTION CONST T□PE	□V CONSTRUCTION □TT□C□E□ □□ □FROM □E□□ OF PO□E	□V CONSTRUCTION CONST T□PE	□V CONSTRUCTION □TT□C□E□ □□ □FROM □E□□ OF PO□E	ST□□ □ET□I□S ST□□ T□PE	ST□□ □ET□I□S ST□□ SI□E	ST□□ □ET□I□S □TT□C□E□ □□ □FROM □E□□ OF PO□E	ST□□ □ET□I□S ST□□ □E□RING □□ □□□	N□□□□ VI□R□TION □□MPERS	N□□□□ □RMOUR RO□S	□□□ITION□□ CONSTRUCTION □ET□I□S
ASSET REMOVAL																	
EP□ □EP□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	REMOVE E□ISTING □V O□ □□RE CON□UCTORS□
EPC □EPE	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	REMOVE E□ISTING □V O□ □□RE CON□UCTORS□
EPF □EP□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	REMOVE E□ISTING □V O□ □□RE CON□UCTORS□
EPG □EP□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	REMOVE E□ISTING S□O□ □□RE CON□UCTORS□
EPG □EP□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	REMOVE E□ISTING □V □N□ S□O□ □□RE CON□UCTORS□
POLE INSTALLATION/CABLE TERMINATION																	
EP□	MO□□□□□□	□□ □E□□	□ □E□□	TIM□ER	□□□ □E□□	E□	□	□	□□□□	□□□□ □V□ □□□□ □V□	□	□	□	□	□	□	□CONVERT E□ISTING □□RE □V T□ROUG□ TERMIN□TION CONSTRUCTION IN TO CONSTRUCTION □□□□ □N□ TERMIN□TE □□□□□□ □□C M□INS □T T□E PO□E□ □RE□OC□TE E□ISTING CROSS□□RM TO T□E OPPOSITE SI□E OF T□E PO□E□ □STRING NE□ □□□□□□ □□C □V M□INS TO □EP□□ □REP□□CE E□ISTING □V □IN□S □□□□□□□ IT□ □V FUSE S□ ITC□ □N□ □□□E□ □ IT□ □SSET NUM□ER □□□□□ □TERMIN□TE E□ISTING □□RE □V M□INS FROM □EP□□□N□ NE□ □□□□□□ □□C M□INS IN T□E □V FUSE S□ ITC□□
EPC	MO□□□□□□	□□ □E□□	□□ □E□□	TIM□ER	□□□ □E□□	E□	□	□	□□□□	□□□□ □V□	□	□	□	□	□	□	□CONVERT E□ISTING □□RE □V TERMIN□TION CONSTRUCTION IN TO CONSTRUCTION □□□□ □N□ TERMIN□TE NE□ □□□□□ □□C M□INS □T T□E PO□E□ □STRING NE□ □□□□□ □□C M□INS TO □EP□□ □RET□IN E□ISTING UGO□ □N□ □V FUSE S□ ITC□ □NR□□T T□E PO□E □N□ TERMIN□TE NE□ □□ STRUNG □□□□□ □□C M□INS IN T□E □V FUSE S□ ITC□□
EP□	MO□□□□□□	□□ □E□□	□ □□SSUME□□	TIM□ER	□□□ □E□□	E□	□	□	□□□□	□□□□ □V□ □□□□ □V TEE□ □□□□□ □V□	□	□	□	□	□	□	□CONVERT E□ISTING □V PIN CONSTRUCTION IN TO INTERME□I□TE CONSTRUCTION □ IT□ TEE□OFF □□□□□ □□TT□C□ NE□ □□□□□□ □□C □V M□INS STRUNG FROM □EP□□ □STRING NE□ □□□□□□ □□C □V M□INS TO □EPE□ □STRING NE□ □□□□□ □□C M□INS FROM □EPC□□N□ TERMIN□TE □T T□E PO□E □□V TEE□OFF□□ NOTE□□□SE□ ON PO□E TIP □O□□ C□□CU□□TIONS□T□E MINIMUM RE□UIRE□ □ OR□ING STRENGT□ OF T□E E□ISTING PO□E IS □□N□
EPE	MO□□□□□□	□□ □E□□	□□ □□SSUME□□	TIM□ER	□□□ □E□□	E□	□	□	□□□□	□□□□ □V□ □□□□ □V□	□	□	□	□	□	□	□CONVERT E□ISTING □□RE □V TERMIN□TION CONSTRUCTION IN TO CONSTRUCTION □□□□ □N□ TERMIN□TE NE□ □□□□□□ □□C M□INS □T T□E PO□E□ □RET□IN E□ISTING UGO□ □N□ □ON□ E□ISTING □V C□□□E TO NE□ □□ STRUNG □□□□□□ □□C M□INS FROM □EP□□ NOTE□□□SE□ ON PO□E TIP □O□□ C□□CU□□TIONS□T□E MINIMUM RE□UIRE□ □ OR□ING STRENGT□ OF T□E E□ISTING PO□E IS □□□N□
EPF	MO□□□□□□	□□ □E□□	□□ □E□□	TIM□ER	□□□ □E□□	E□	□	□	□□□□	□□□□ □V□ □□□□ □V□	□	□	□	□	□	□	□CONVERT E□ISTING □□RE □V TERMIN□TION CONSTRUCTION IN TO CONSTRUCTION □□□□ □N□ TERMIN□TE NE□ □□□□□□ □□C M□INS □T T□E PO□E□ □RET□IN E□ISTING UGO□ □N□ □ON□ E□ISTING □V C□□□E TO NE□ □□ TERMIN□TE□ □□□□□□ □□C M□INS □T T□E PO□E□ □STRING NE□ □□□□□□ □□C M□INS TO □EPG□
EPG	MO□□□□□□	□□ □E□□	□□ □E□□	TIM□ER	□□□ □E□□	E□	□	□	□□□□ □□□□ □□□□	□□□□ □S□□ □□□□ □V□ □□□□ □V□ □□□□ □V TEE□ □□□□ □V TEE□	□	□	□	□	□	□	□INST□□□ NE□ S□T□ROUG□ TERMIN□TION CONSTRUCTION □□□□ □N□ TERMIN□TE NE□ □□□□ □□C S□M□INS □T T□E PO□E□ □STRING NE□ □□□□ □□C S□M□INS TO □EP□□□N□ □EP□□ □CONVERT E□ISTING □V □□RE TERMIN□TION CONSTRUCTION IN TO CONSTRUCTION □□□□ □N□ TERMIN□TE NE□ □□□□□□ □□C □V M□INS FROM □EPF□ □STRING NE□ □□□□□□ □□C M□INS TO □EP□□□V TEE□ □REP□□CE E□ISTING □V □IN□S □□□□□□□□ IT□ □ NE□ □V FUSE S□ ITC□ □N□ □□□E□ □ IT□ □SSET NUM□ER □□□□□□INST□□□ T□E NE□ □V FUSE S□ ITC□ □ET□ EEN SP□NS □EPF□□EPG□□N□ □EPG□□EP□□TERMIN□TE NE□ □□ STRUNG □□□□□□ □□C □V M□INS FROM □EPF□IN T□E □V FUSE S□ ITC□□ □CONVERT E□ISTING □□RE □V □□RE TERMIN□TION CONSTRUCTION IN TO CONSTRUCTION □□□□ □N□ TERMIN□TE NE□ □□□□□□ □□C M□INS TO □EP□□ □REP□□CE E□ISTING I□T □NR□□ IT□ □ NE□ □V FUSE S□ ITC□ □N□ □□□E□ □ IT□ □SSET NUM□ER □□□□□□T□C□□INST□□□ T□E NE□ □V FUSE S□ ITC□ □ET□ EEN SP□NS □EPG□□EP□□□N□ □EPG□□EP□□TERMIN□TE NE□ □□ STRUNG □□□□□□ □□C □V M□INS TO □EP□IN T□E □V FUSE S□ ITC□□ □RET□IN E□ISTING □V UGO□ □N□ □ON□ E□ISTING □V C□□□E TO NE□ □□ STRUNG □□□□□□ □□C □V M□INS TO □EP□□
EP□	MO□□□□□□	□□ □E□□	□□ □E□□	TIM□ER	□□□ □E□□	E□	□	□	□□□□ □□□□	□□□□ □S□□ □□□□ □V□ □□□□ □V□	□	□	□	□	□	□	□CONVERT E□ISTING □□RE S□T□ROUG□ TERMIN□TION CONSTRUCTION IN TO CONSTRUCTION □□□□ □N□ TERMIN□TE E□ISTING □□RE S□M□INS □□□□□ FROM □EP□□□T T□E PO□E□TERMIN□TE NE□ □□□□ □□C M□INS STRUNG FROM □EPG□□N□ □ON□ TO □□RE S□M□INS□ □CONVERT E□ISTING □□RE □V T□ROUG□ TERMIN□TION CONSTRUCTION IN TO CONSTRUCTION □□□□ □N□ TERMIN□TE E□ISTING □□RE □V M□INS □□□□□ □ □□□□□FROM □EP□□□T T□E PO□E□TERMIN□TE NE□ □□□□□□ □□C M□INS STRUNG FROM □EPG□□N□ □ON□ TO □□RE □V M□INS□ □□ON□ E□ISTING □□RE □V M□INS □□□□□□FROM □EP□□TOP CIRCUIT ON□□□TO NE□ □□□□□□ □□C SP□N FROM □EPG□
EP□	MO□□□□□□	□□□□	□ □E□□	TIM□ER	□□□ □E□□	E□	□	□	□□□□ □□□□	□□□□ □S□□ □□□□ □V□ □□□□ □V□	□	□	□	□	□	□	□INST□□□ NE□ S□CONSTRUCTION □□□□ □N□ TERMIN□TE E□ISTING □□RE S□M□INS □□□□□FROM □EP□□□T T□E PO□E□TERMIN□TE NE□ □□□□ □□C M□INS STRUNG FROM □EPG□□N□ □ON□ TO E□ISTING □□RE S□M□INS□ □RET□IN E□ISTING □V CROSS□□RM □OTTOM□□N□ INST□□□ NE□ □V TERMIN□TION CONSTRUCTION □□□□□TERMIN□TE NE□ □□□□□□ □□C M□INS STRUNG FROM □EPG□□T T□E PO□E□ □□ON□ E□ISTING □□RE □V M□INS □□□□□□□□□FROM □EP□□TO NE□ □□□□□□ □□C SP□N FROM □EPG□ □□ON□ E□ISTING O□ SERVICE M□INS □N□ SERVICE UGO□ C□□□E TO NE□ □□□□□□ □□C SP□N FROM □EPG□

NOTES TO THE TABLE

□□T□E □SP□IS C□UTIONE□ □G□INST POTENTI□□□□ □□□□R□OUS PO□E TOP □O□□ C□□NGES T□□T M□□ OCCUR □URING T□E CONSTRUCTION OF T□IS PRO□ECT□CONSI□ER□TION MUST □E GIVEN TO T□E SUPPORTING OF PO□ES PRIOR TO T□E □ OR□ □EING C□RRIE□ OUT□

□□□ □ERE T□E STRENGT□ OF E□ISTING PO□ES □RE NOT □V□I□□□□E□T□E □SP□IS RESPONSI□□E FOR □SSESSING T□E E□ISTING PO□ES TO CONFIRM IT CORRESPON□S □ IT□ T□E MINIMUM RE□UIRE□ STRENGT□ R□TING SPECIFIE□ IN T□E T□□□E□

OVERHEAD MAINS CONDUCTOR DETAIL

REF□I□ENTIFIER	CIRCUIT VO□T□GE	N□□OF C□□□ES	CON□UCTOR T□PE	□E□□ EN□ SECTION □ENGT□ □□ □	TOT□□ C□□□E □ENGT□ □□ □
CABLE REMOVAL					
EPC □EPE	□V	□	□□□ □□C□	□□□□	□□□□□
EP□ □EP□	□V	□	□□ □□CU□	□□□□	□□□
EPF □EP□	□V	□	□□□ □□C□	□□□□	□□□
EPG □EP□	S□	□	□ □□CU□	□□□□	□□□□
EPG □EP□	□V	□	□□□ □□C□	□□□□	□□□□□
EPG □EP□	S□	□	□ □□CU□	□□□□	□□□□
CABLE INSTALLATION					
EPC □EP□	□V	□	□□□V □□□ □□C□ □□ □□□C	□□□□	□□
EP□ □EPE	□V	□	□□□V □□ □□C□ □□ □□□C	□□□□	□□□
EPF □EP□	□V	□	□□□V □□ □□C□ □□ □□□C	□□□□	□□□
EPG □EP□	S□	□	□□□V □□ □□C□ □□ □□□C	□□□□	□□
EPG□EP□	□V	□	□□□V □□ □□C□ □□ □□□C	□□□□	□□
EPG□EP□	S□	□	□□□V □□ □□C□ □□ □□□C	□□□□	□□

OVERHEAD MAINS STRINGING TABLE (SECTION D)

DESIGN SPAN:	MO□□□□□□	**TO**	MO□□□□□□	**RULING SPAN (m)**	□□□□	**VOLTAGE**	□□□V		
STRAIN POINTS:	MO□□□□□□	**TO**	MO□□□□□□	**CABLE TENSION**	□ □ UTS	**MAX.OPERATING TEMP**	□□ □ □□□C		
CABLE DETAIL:	□□□V □□ □□C □ □□ □□□C					**CONDUCTOR CODE:**	□□□□		
□M□IENT TEMP□	□	□	□□	□□	□□	□□	□□	□□	□□
TENSION □N □□ □ □d□	□□□□	□□□□	□□□□	□□□	□□□□	□□□□	□□□□	□□□	□□□□
S□G □□ □	□□□	□□□	□□□	□□□	□□	□□□	□□□	□□	□□□
TIME □□□□□	□□	□□	□□	□□	□□	□□	□□	□□	□□

OVERHEAD MAINS STRINGING TABLE (SECTION D)

DESIGN SPAN:	MO□□□□□□	**TO**	MO□□□□□□	**RULING SPAN (m)**	□□□□	**VOLTAGE**	□□□V		
STRAIN POINTS:	MO□□□□□□	**TO**	MO□□□□□□	**CABLE TENSION**	□ □ UTS	**MAX.OPERATING TEMP**	□□ □ □□□C		
CABLE DETAIL:	□□□V □□ □□C □ □□ □□V□□C □ □□ □□C □ □□ □□V□□C					**CONDUCTOR CODE:**	□□□□□		
□M□IENT TEMP□	□	□	□□	□□	□□	□□	□□	□□	□□
TENSION □N □□ □ □d□	□□□□	□□□□	□□□□	□□□	□□□□	□□□□	□□□□	□□□	□□□□
S□G □□ □	□□□	□□□	□□□	□□□	□□	□□□	□□□	□□	□□□
TIME □□□□□	□□	□□	□□	□□	□□	□□	□□	□□	□□

OVERHEAD MAINS STRINGING TABLE (SECTION E)

DESIGN SPAN:	MO□□□□□□	**TO**	MO□□□□□□	**RULING SPAN (m)**	□□□□	**VOLTAGE**	□□□V		
STRAIN POINTS:	MO□□□□□□	**TO**	MO□□□□□□	**CABLE TENSION**	□ □ UTS	**MAX.OPERATING TEMP**	□□ □ □□□C		
CABLE DETAIL:	□□□V □□ □□C □ □□ □□□C					**CONDUCTOR CODE:**	□□□□		
□M□IENT TEMP□	□	□	□□	□□	□□	□□	□□	□□	□□
TENSION □N □□ □ □d□	□□□□	□□□□	□□□□	□□□	□□□□	□□□□	□□□□	□□□	□□□□
S□G □□ □	□□□	□□□	□□□	□□□	□□	□□□	□□□	□□	□□□
TIME □□□□□	□□	□□	□□	□□	□	□□	□□	□□	□□

OVERHEAD MAINS STRINGING TABLE (SECTION E)

DESIGN SPAN:	MO□□□□□□	**TO**	MO□□□□□□	**RULING SPAN (m)**	□□□□	**VOLTAGE**	□□□V		
STRAIN POINTS:	MO□□□□□□	**TO**	MO□□□□□□	**CABLE TENSION**	□ □ UTS	**MAX.OPERATING TEMP**	□□ □ □□□C		
CABLE DETAIL:	□□□V □□ □□C □ □□ □□V□□C □ □□ □□C □ □□ □□V□□C					**CONDUCTOR CODE:**	□□□□□		
□M□IENT TEMP□	□	□	□□	□□	□□	□□	□□	□□	□□
TENSION □N □□ □ □d□	□□□□	□□□□	□□□□	□□□	□□□□	□□□□	□□□□	□□□	□□□□
S□G □□ □	□□□	□□□	□□□	□□□	□□	□□□	□□□	□□	□□□
TIME □□□□□	□□	□□	□□	□□	□	□□	□□	□□	□□

□□ □□ □□□C OFFSET □□S □EEN □□□O□ E□ FOR CREEP □□□O□ □NCE□

OVERHEAD MAINS STRINGING TABLE (SECTION A)

DESIGN SPAN:	MO□□□□□□	**TO**	MO□□□□□□	**RULING SPAN (m)**	□□□□	**VOLTAGE**	□□□V		
STRAIN POINTS:	MO□□□□□□	**TO**	MO□□□□□□	**ACTUAL SPAN (m)**	□□□□	**MAX.OPERATING TEMP**	□□ □ □□□C		
				CABLE TENSION	□ □ UTS				
CABLE DETAIL:	□□□V □□ □□C □ □□ □□□C □ □□ □□C □ □□ □□□C					**CONDUCTOR CODE:**	□□□□		
□M□IENT TEMP□	□	□	□□	□□	□□	□□	□□	□□	□□
TENSION □N □□ □ □d□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□
S□G □□ □	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□
TIME □□□□□	□□	□□	□	□□	□□	□□	□□	□□	□□

OVERHEAD MAINS STRINGING TABLE (SECTION A)

DESIGN SPAN:	MO□□□□□□	**TO**	MO□□□□□□	**RULING SPAN (m)**	□□□□	**VOLTAGE**	□□□V		
STRAIN POINTS:	MO□□□□□□	**TO**	MO□□□□□□	**ACTUAL SPAN (m)**	□□□□	**MAX.OPERATING TEMP**	□□ □ □□□C		
				CABLE TENSION	□ □ UTS				
CABLE DETAIL:	□□□V □□ □□C □ □□ □□□C □ □□ □□C □ □□ □□□C					**CONDUCTOR CODE:**	□□□□		
□M□IENT TEMP□	□	□	□□	□□	□□	□□	□□	□□	□□
TENSION □N □□ □ □d□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□
S□G □□ □	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□
TIME □□□□□	□□	□□	□□	□□	□□	□□	□□	□□	□□

OVERHEAD MAINS STRINGING TABLE (SECTION B)

DESIGN SPAN:	MO□□□□□□	**TO**	MO□□□□□□	**RULING SPAN (m)**	□□□□	**VOLTAGE**	□□□V		
STRAIN POINTS:	MO□□□□□□	**TO**	MO□□□□□□	**CABLE TENSION**	□ □ UTS	**MAX.OPERATING TEMP**	□□ □ □□□C		
CABLE DETAIL:	□□□V □□□ □□C □ □□ □□□C					**CONDUCTOR CODE:**	□□□□		
□M□IENT TEMP□	□	□	□□	□□	□□	□□	□□	□□	□□
TENSION □N □□ □ □d□	□□□□	□□□□	□□□□	□□□	□□□□	□□□□	□□□□	□□□□	□□□□
S□G □□ □	□□□	□□□	□□□	□□	□□□	□□□	□□□	□□□	□□□
TIME □□□□□	□□	□□	□□	□	□□	□□	□□	□□	□□

OVERHEAD MAINS STRINGING TABLE (SECTION C)

DESIGN SPAN:	MO□□□□□□	**TO**	MO□□□□□□	**RULING SPAN (m)**	□□□□	**VOLTAGE**	□□□V		
STRAIN POINTS:	MO□□□□□□	**TO**	MO□□□□□□	**CABLE TENSION**	□ □ UTS	**MAX.OPERATING TEMP**	□□ □ □□□C		
CABLE DETAIL:	□□□V □□ □□C □ □□ □□V□□C □ □□ □□C □ □□ □□V□□C					**CONDUCTOR CODE:**	□□□□		
□M□IENT TEMP□	□	□	□□	□□	□□	□□	□□	□□	□□
TENSION □N □□ □ □d□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□
S□G □□ □	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□	□□□
TIME □□□□□	□□	□□	□□	□□	□	□□	□□	□□	□□

POLE PROFILE (Poles 'N' Wires v7.11.0.1185)

□ORI□ONT□□ SC□□E □□□□

VERTIC□□ SC□□E □□□□

CAD DRAWING □□□□□□

AMENDMENTS

ASSOCIATED DRAWINGS

PREPARED BY:

UEA

□□□□□□□□□□ □□□

ASP REF.	□□□□□□ □□□□□□□□□
DESIGNED BY	PETER □IONG
AUTH NO.	□□□□□□
SUBMIT DATE	SU□MITTE□ □□□□□□□□□
LGA	NORT□ S□□NE□ COUNCI□
MAP REF.	□□□F□□
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□□

CERTIFICATION NUMBER 1050015/20170411

NET□ OR□ O□ □UGMENT□TIONS
S□□NE□ METRO
CRO□ S NEST ST□TION SITE
C□□R□E STREET
CRO□ S NEST

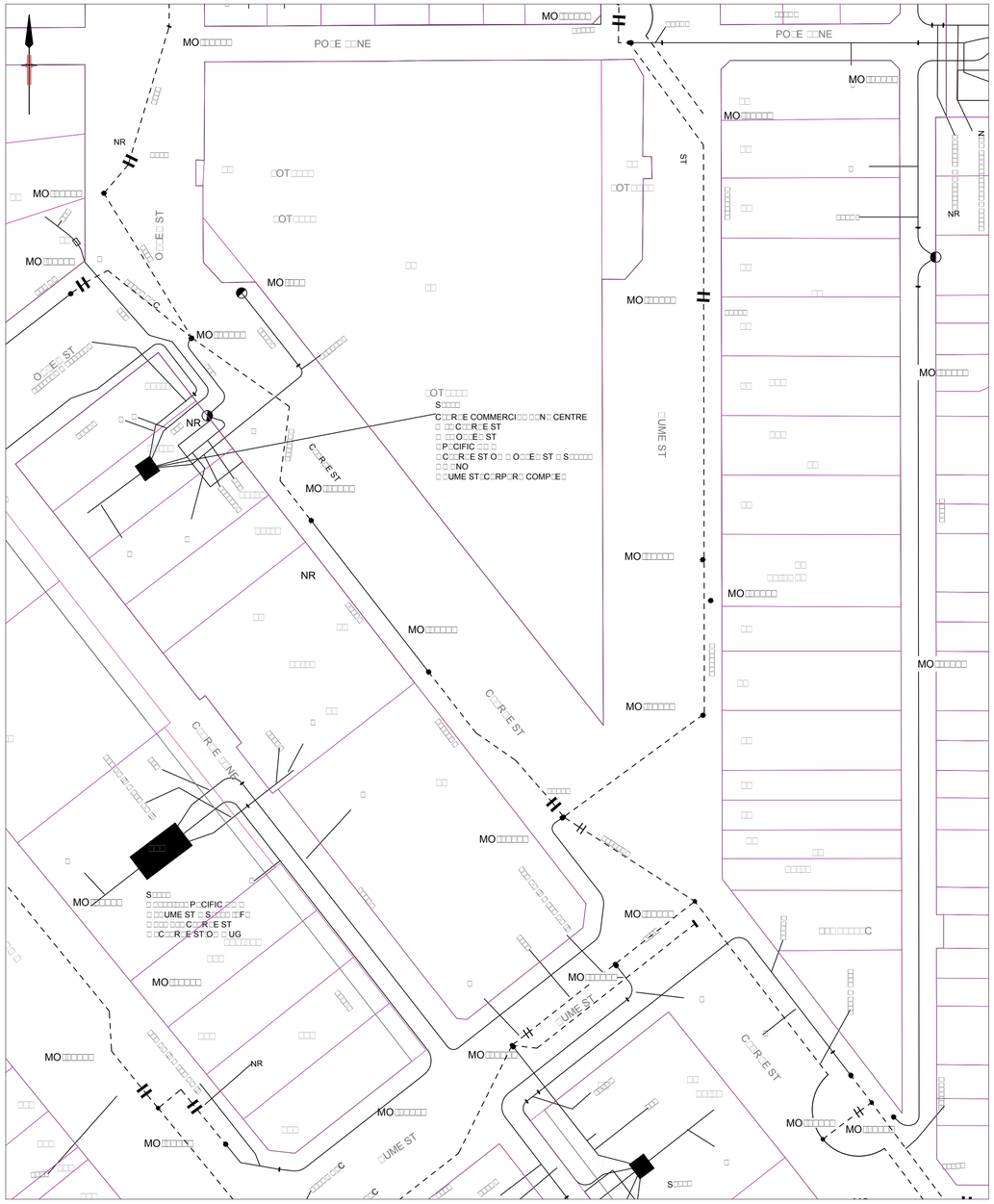
SIZE □□

AUSGRID PROJECT No. SC□□□□□

SHEETS □ of □

AMD. □

□□□□□□□



EXISTING LV GEOSCHEMATICS

NOT TO SC□□E

PROPOSED LV GEOSCHEMATICS

NOT TO SC□□E

CAD DRAWING
AMENDMENTS

ASSOCIATED DRAWINGS

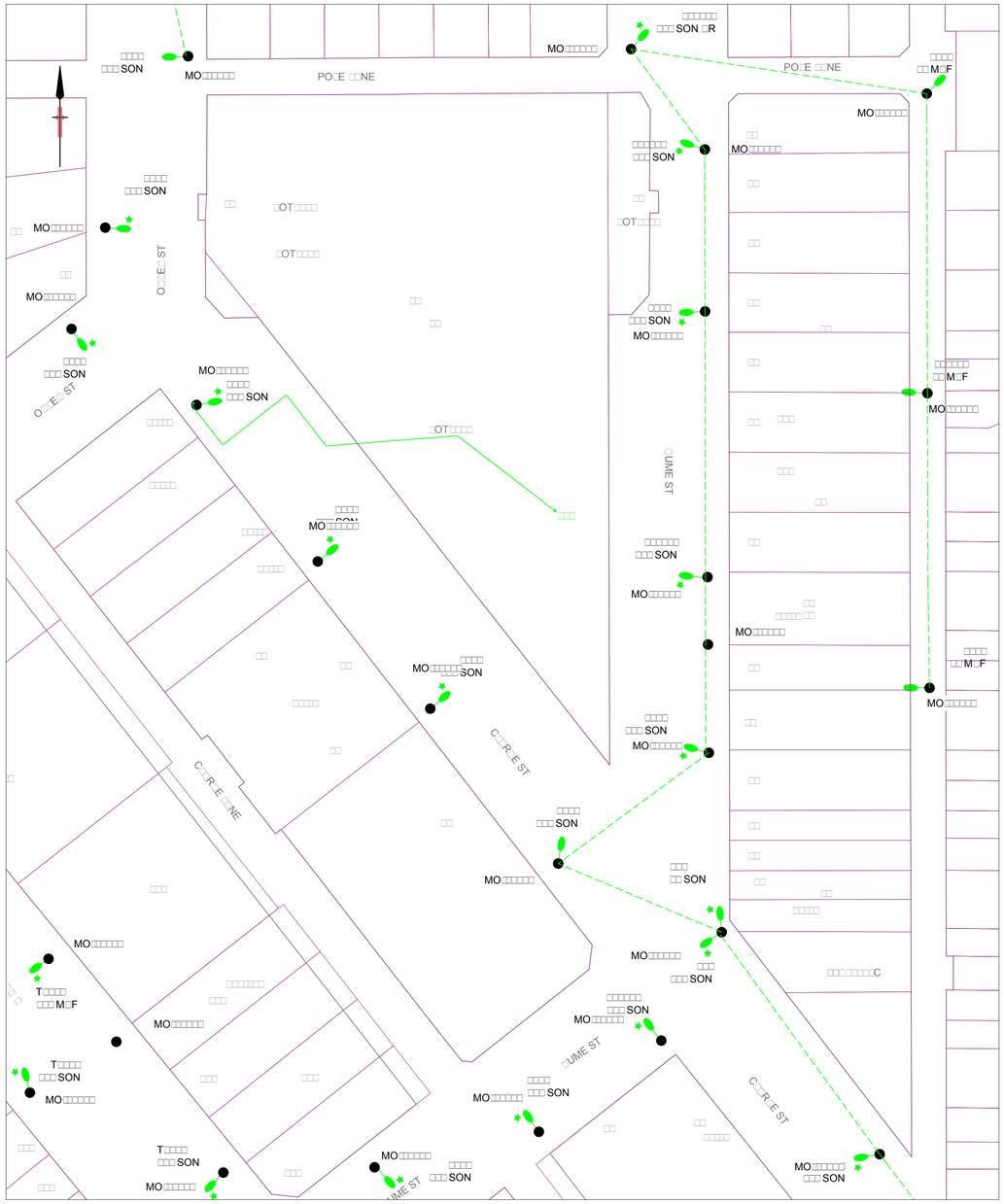
PREPARED BY:

DESIGNED BY	PETER □IONG
AUTH NO.	□□□□□□□
SUBMIT DATE	SU□MITTE□ □□□□□□□□□□
LGA	NORT□ S□□NE□ COUNCI□
MAP REF.	□□□ F□□
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□□□
ASP REF.	□□□□□□□ □□□□□□□□□□

CERTIFICATION NUMBER 1050015/20170411

NET□ OR□ O□ □UGMENT□TIONS
S□□NE□ METRO
CRO□ S NEST ST□TION SITE
C□□R□E STREET
CRO□ S NEST

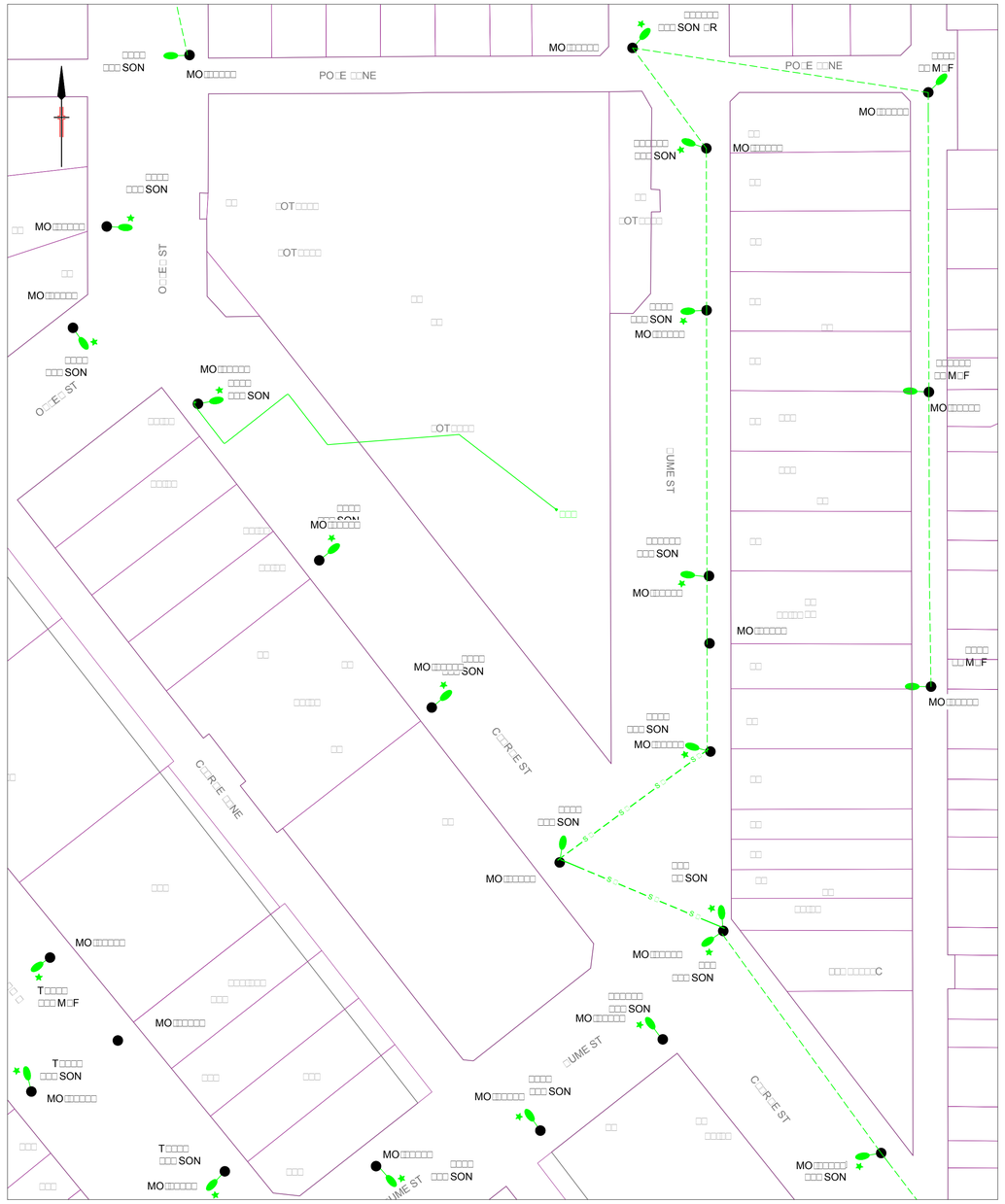
SIZE □□ AUSGRID PROJECT No. SC□□□□□ SHEETS □ of □ AMD. □



EXISTING SL GEOSCHEMATICS

NOT TO SCALE

TO VARIOUS SL
TERMINATION POINTS AND
SLCP (S□□□□□□□T PO□E
MO□□□□□□□□T □TC□ISON ST



PROPOSED SL GEOSCHEMATICS

NOT TO SCALE

TO VARIOUS SL
TERMINATION POINTS AND
SLCP (S□□□□□□□T PO□E
MO□□□□□□□□T □TC□ISON ST

CAD DRAWING

AMENDMENTS

ASSOCIATED DRAWINGS

PREPARED BY:

UEA

DESIGNED BY	PETER □IONG
AUTH NO.	□□□□□□□
SUBMIT DATE	SUBMITTED □□□□□□□□□□
LGA	NORTH SYDNEY COUNCIL
MAP REF.	□□□ F□□
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□□□
ASP REF.	□□□□□□□ □□□□□□□□□□

CERTIFICATION NUMBER 1050015/20170411

NETWORK OF AUGMENTATIONS
SYDNEY METRO
CROWS NEST STATION SITE
CLARKE STREET
CROWS NEST

SIZE □□

AUSGRID PROJECT No. SC□□□□□

SHEETS □ of □

AMD. □

©

Address all relevant correspondence to:

Ausgrid Contestability Section
Building 3, 51-59 Bridge Road
Hornsby NSW 2077

E: Contestability@ausgrid.com.au

02/06/2017

UEA Electrical
Attention: Peter Xiong
5/2 Southridge St
Eastern Creek Nsw 2766

Email: pxiong@uea.com.au

Project Number: SC09402

Dear Peter,

Electricity Network Connection Application at: 497 Pacific Hwy Crows Nest

Ausgrid has certified the electrical design plan(s) SC09402 amendment 0. The certification number for this design is 1033960/20170602. In providing this certification, Ausgrid makes no warranty, express or implied that the design is fit for the intended purpose or is suitable for the site conditions. The certification is provided exclusively on the basis of the design submitted without reference to any underlying assumptions or conditions and in accordance with the Design Contract Connection Assets.

The certified design plans have been forwarded electronically to your email address for your use.

The Applicant will be notified of the drawing certification and the conditions that must be met for the project to proceed to the next stage.

Should you require any further information please contact me on the phone number or email address detailed below.

Yours sincerely,

Shanming Zhou
Contestability Project Coordinator
Ausgrid

Direct Telephone Number: 9477 8357
Email: szhou@ausgrid.com.au

Encl: Drawing SC09402 Certified Design amendment 0

LOCALITY MAP
NOT TO SC□□E

NOTES

□□ T□IS □R□□ ING IS TO □E RE□□ IN CON□UNCTION □ IT□ □USGRI□S NET□ OR□ ST□N□□R□S□

□□ □CCRE□ITE□ □ESIGNER IS TO □E CONT□CTE□ REG□R□ING ISSUES R□ISE□ □ IT□ T□IS □ESIGN□UE□ E□ECTRIC□□ C□N □E CONT□CTE□ □□ P□ONE ON□□□ □□□□ □□□□ OR □□ F□□□□□ □□□□ □□□□

□□ C□□IMS FOR V□RI□TIONS TO T□E COST OF NON□CONTEST□□□E □ OR□S□INC□U□ING ROC□ E□C□V□TION□□ I□□ NOT □E □CCEPTE□ UN□ESS VERIFIE□ ON SITE □□ T□E □USGRI□ □ □I□E T□E □ OR□S □RE IN PROGRESS□

□□ T□E □SP□ IS RESPONSI□□E FOR UN□ERT□□ING S□TISF□CTOR□ CONSU□T□TION □ IT□ □□□ □OC□□ CUSTOMERS □ □O M□□ POTENTI□□□□ □E □FFECTE□ □□ T□E CONSTRUCTION □ OR□S INC□U□ING □□□ □□TER□TIONS TO SERVICE M□INS□

□□ T□E □SP□ MUST MINIMISE T□E IMP□CT OF T□E □ OR□S ON T□E E□ECTRICIT□ SUPP□□ TO CUSTOMERS □N□ INTERRUPTIONS TO SUPP□□ MUST □E □VOI□E□ □ □ERE EVER POSSI□□E□□T □E□ST FOUR □□□C□E□R □USINESS □□□S NOTICE MUST □E PROVI□E□ TO □□□ □FFECTE□ CUSTOMERS PRIOR TO □N□ P□□NNE□ INTERRUPTIONS TO T□E E□ECTRICIT□ SUPP□□□ NOTICE MUST □E IN □ RITING IN □CCOR□□NCE □ IT□ C□□USE □□ OF T□E N□TION□□ ENERG□ RET□I□ RU□ES□

□□ SPECIFIC PRIOR □PPROV□□ MUST □E SOUG□T FROM □USGRI□ FOR □N□ P□□NNE□ E□ECTRICIT□ SUPP□□ INTERRUPTIONS □ □ERE T□E P□□NNE□ INTERRUPTION □ I□□ E□CEE□ ONE □□□□OUR IN □UR□TION OR T□E □UR□TION □ I□□ □E □ESS T□□N ONE □OUR□□UT □ SUIT□□□E TIME FOR T□E INTERRUPTION C□NNOT □E MUTU□□□□ □GREE□ TO □ IT□ T□E □FFECTE□ CUSTOMER□S□□

□□ T□E □SP□ IS TO M□INT□IN □□E□U□TE PU□□IC □IG□TING □EVE□S FOR T□E □UR□TION OF T□E □ OR□S□IF NECESS□R□□ T□E □SP□ IS TO □RR□NGE FOR SUIT□□□E TEMPOR□R□ STREET □IG□TING TO □E PROVI□E□ UNTI□ PERM□NENT □IG□TING IS RE□EST□□□IS□E□□

□□ T□E □SP□ IS RE□UIRE□ TO COMP□□ □ IT□ T□E CORRECT PROCE□URE□S□FOR □ OR□ING □ IT□ □N□□OR NE□R □S□ESTOS M□TERI□□ □REFER TO □USGRI□ NUS□□□ □□ OR□ING □ IT□ □S□ESTOS PRO□UCTS□□

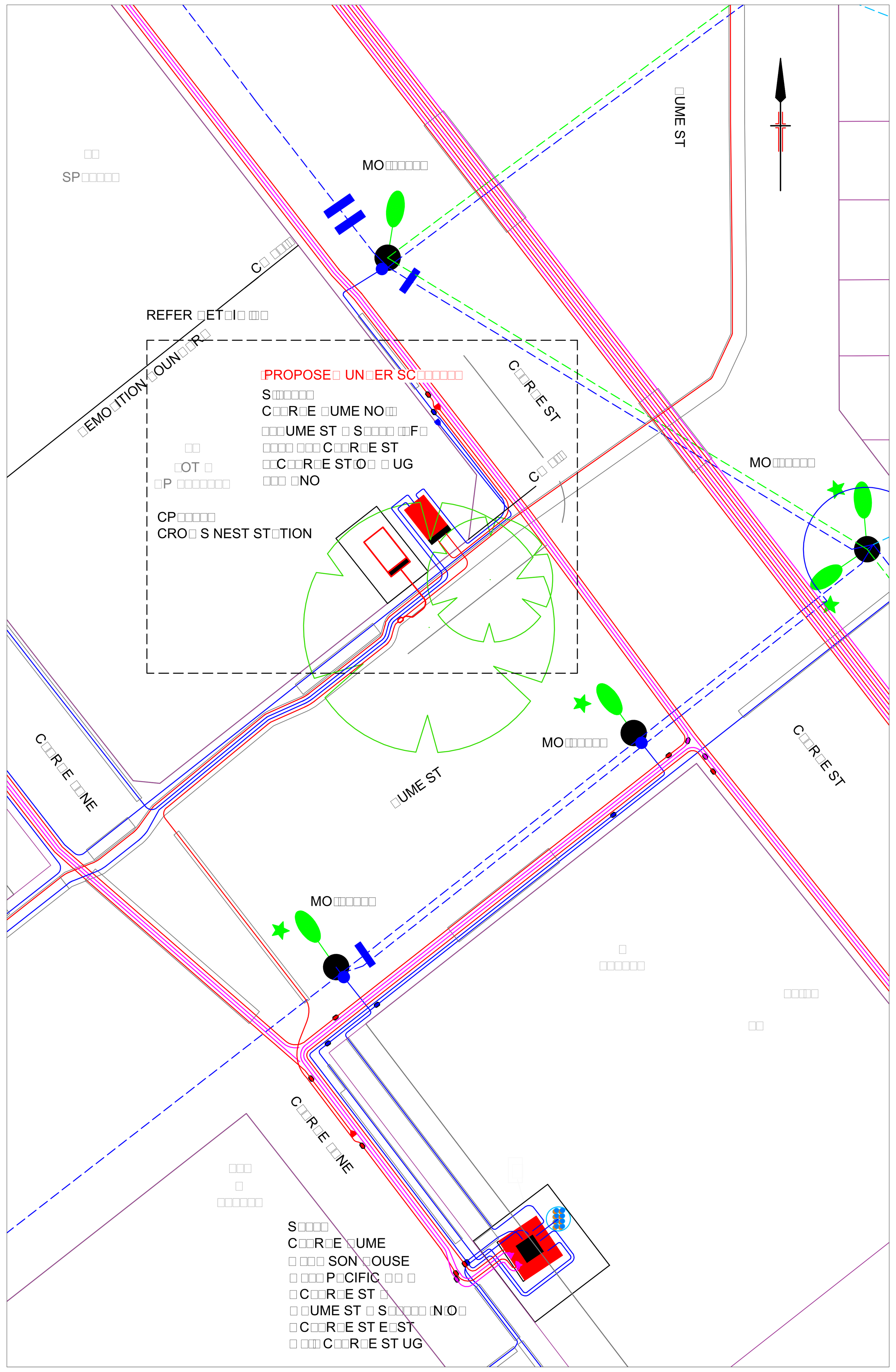
□□ T□E FINIS□E□ SURF□CE □RE□ □ROUN□ T□E SU□ST□TION IS TO COMP□□ □ IT□ NS□□□□

□□□ □EVE□ □ □SP IS TO CONT□CT □I□□ □EFORE □OU □IG ON □□□□ □T □E□ST T□ O □□□S PRIOR TO COMMENCEMENT OF □ OR□S□□□□ SERVICES □□□CENT TO E□C□V□TIONS □RE TO □E □OC□TE□ □N□ I□ENTIFIE□ PRIOR TO E□C□V□TION□

□□□ □□□FOOTP□T□ □N□ RO□□ E□C□V□TIONS □RE TO □E RESTORE□ TO □OC□□ GOVERNMENT OR □UT□ORIT□ □IRECTION□ CONT□CT □OC□□ GOVERNMENT OR □UT□ORIT□ PRIOR TO T□E COMMENCEMENT OF CONSTRUCTION □ OR□S□

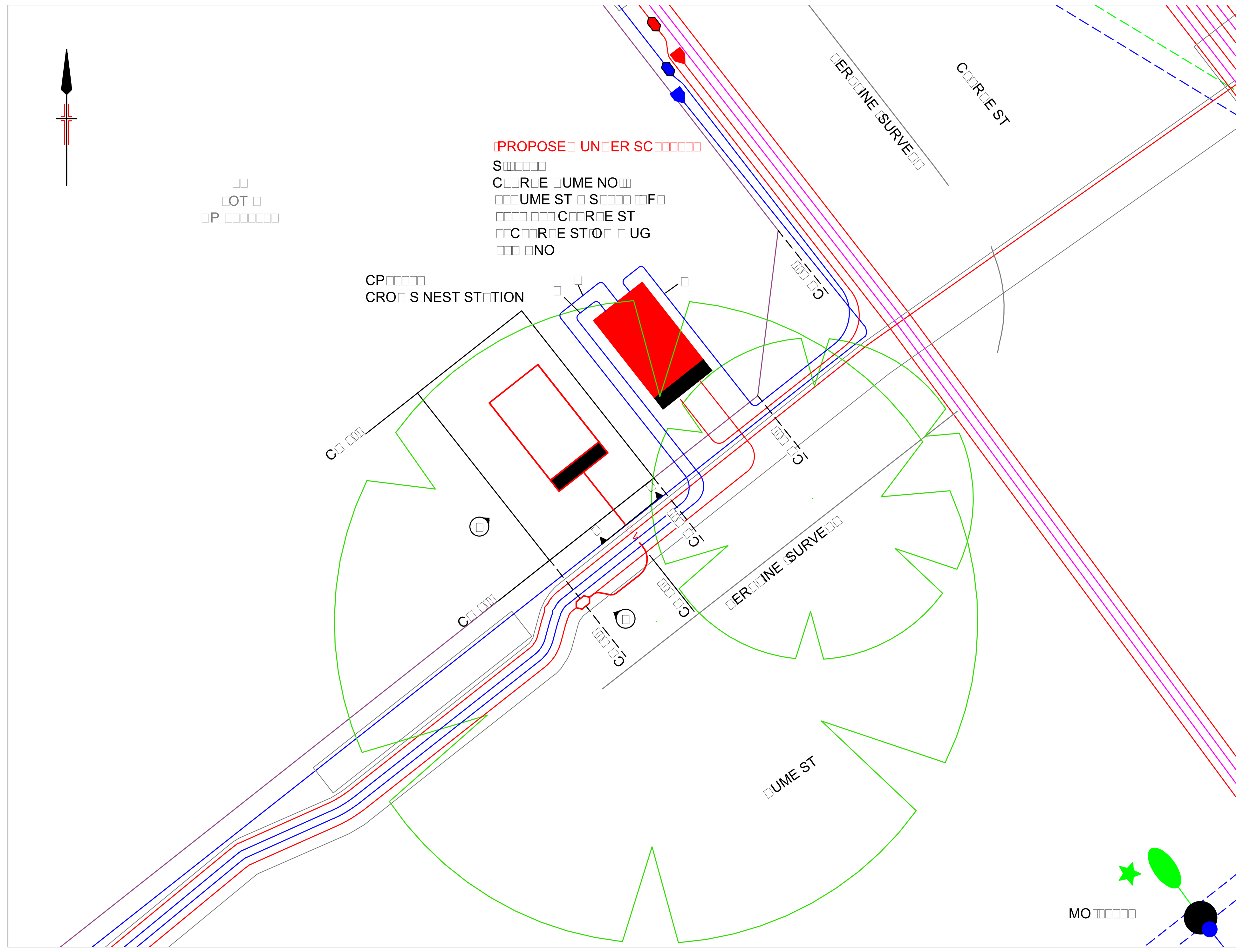
□□□ T□IS INFORM□TION INC□U□ES □□T□ FROM T□E NS□ □IGIT□□ C□□□STR□□ □□T□□□SE □□ □□N□ □N□ PROPERT□ INFORMATION © 2016, USED UNDER CREATIVE COMMONS LICENCE VERSION 4.0.

□□□ FOR I□ENTIFIC□TION □N□ □OINTING PURPOSES□□□□C□□□E EN□S S□□□□ □E □□□E□□E□ □T T□E TERMIN□TION □OC□TIONS □N□ IN □OINT □□□S □URING C□□□E INST□□□□TION□T□E C□□□ES MUST □E □□□E□□E□ □S PER CERTIFIE□ □ESIGN □R□□ ING□



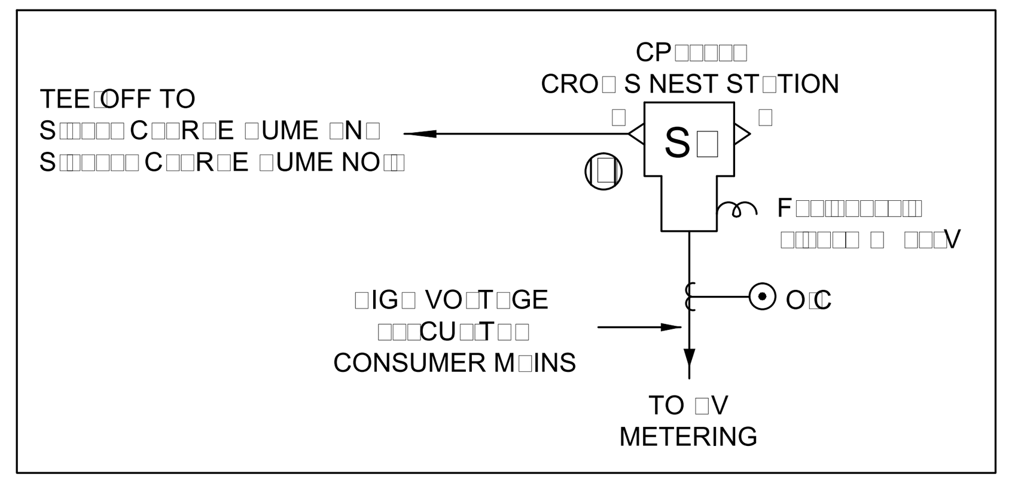
CONSTRUCTION PLAN
SC□□E □□□□□

SCALE 1 : 250



DETAIL PLAN 'A'
SC□□E □□□□□

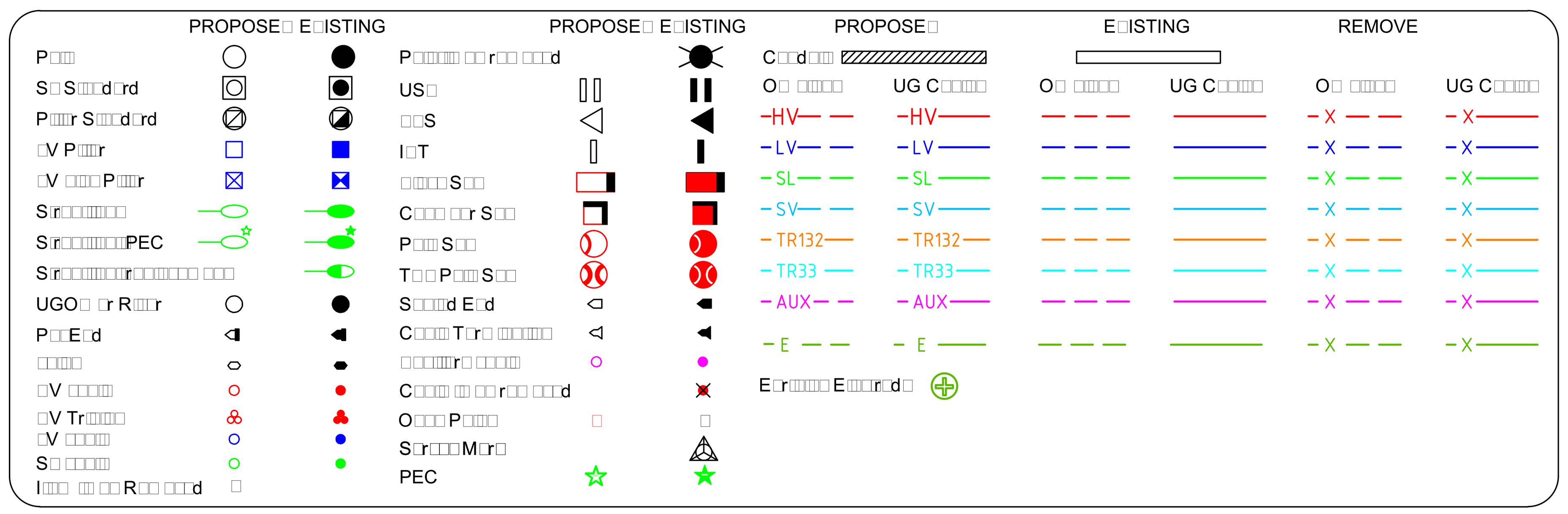
SCALE 1 : 100

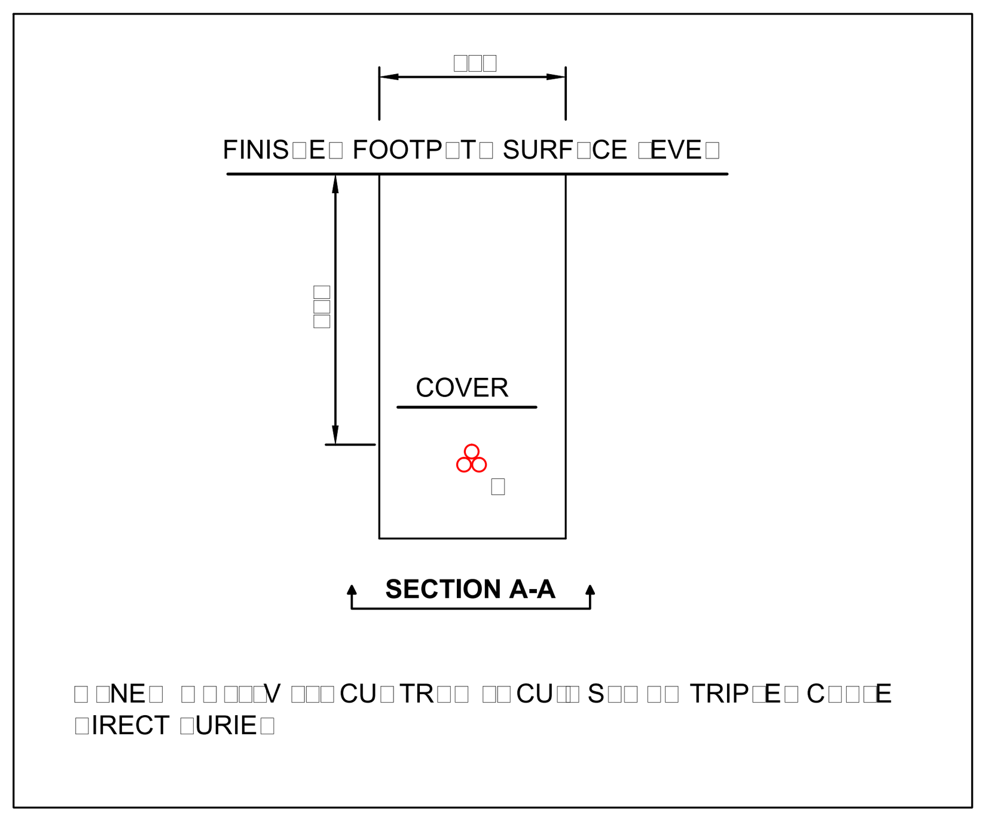


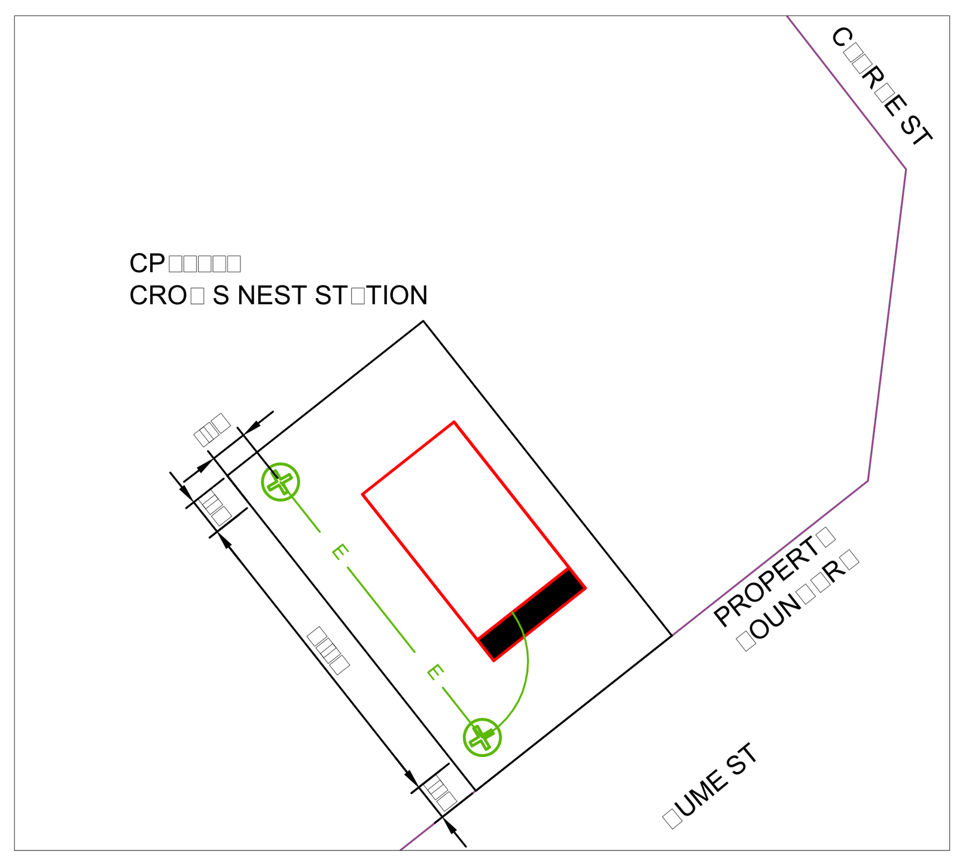
HVC SCHEMATIC DIAGRAM

KIOSK SUBSTATION DETAILS	
SU□ST□TION N□ME□	CRO□ S NEST ST□TION
SU□ST□TION NUM□ER□	CP□□□□□
□□□RESS□	□□ C□□R□E ST□CRO□ S NEST
SU□ST□TION T□PE□	□□
SI□E □□V□□□	N□□
VECTOR GROUP□	N□□
T□P SETTING□	N□□
□V S□ ITC□GE□R□	SC□NEI□ER E□ECTRIC I□I RM□RMIC□
□V FUSE □ET□I□S□	N□□
□O□□ C□C□E□	CONTINUOUS
CONFIGURE □S □□□□□□	NO
E□RT□ING RE□UIREMENTS□	□S PER NS□□□□ □N□ □USGRI□ E□RT□ING □ESIGN SPECIFIC□TION □C□□□□□□□
SU□ST□TION PIERING□	□S PER NS□□□□ □R□□ ING □□□□□□ FOR T□E INST□□□□TION OF SU□ST□TION PIERING
E□SEMENT P□□N □ET□I□□	□S PER NS□□□□ "SITE P□□N" □T□PE □IOS□

LEGEND







HVC EARTHING LAYOUT
SC□□E □□□□□

SCALE 1 : 100

EARTHING INSTALLATION FOR CP78013		
	□ESIGN	□S □UI□T
E□RT□ING CONFIGUR□TION	□V ON□□	
E□ECTRO□E INST□□□□TION	□RIVEN	
HV ELECTRODES		
NO OF E□ECTRO□ES	□	
□EPT□ OF E□ECTRO□E	□□□	□
E□ECTRO□E SP□CING	□□□	□
M□□IMUM RESIST□NCE □NORM□□	□□□□□	Ω
M□□IMUM RESIST□NCE □□ROUG□T	□□□□□	Ω
ME□SURE□ RESIST□NCE		Ω
MINIMUM SEPARATION DISTANCES		
SEP□R□TION □ET□ EEN □V □N□ MEN E□ECTRO□ES	□□□	□
MINIMUM SEPER□TION FROM □ONG MET□□□IC □SSETS □ IT□ □IG□ □I□E□I□OO□ OF COTN□CT□ □E□G□MET□□□IC FENCES NE□R SC□OO□S□CR□S□ □□RRIERS NE□R □US□STOPS□CO□OUR□□ON□ FENCES NE□R □OUSES OR UR□	□□□	□
SEP□R□TION TO TE□ECOMMUNIC□TIONS	□□□	□

C□EC□ FOR OT□ER SERVICES □EFORE □ORING OR E□C□V□TING

DESIGNED BY	PETER □IONG
AUTH NO.	□□□□□□□
SUBMIT DATE	SU□MITTE□ □□□□□□□□□□
LGA	NORT□ S□□NE□
MAP REF.	□□ F□□
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□□

PREPARED BY: UEA
ASP REF. □□□□□□□ □□□□□□□□□□

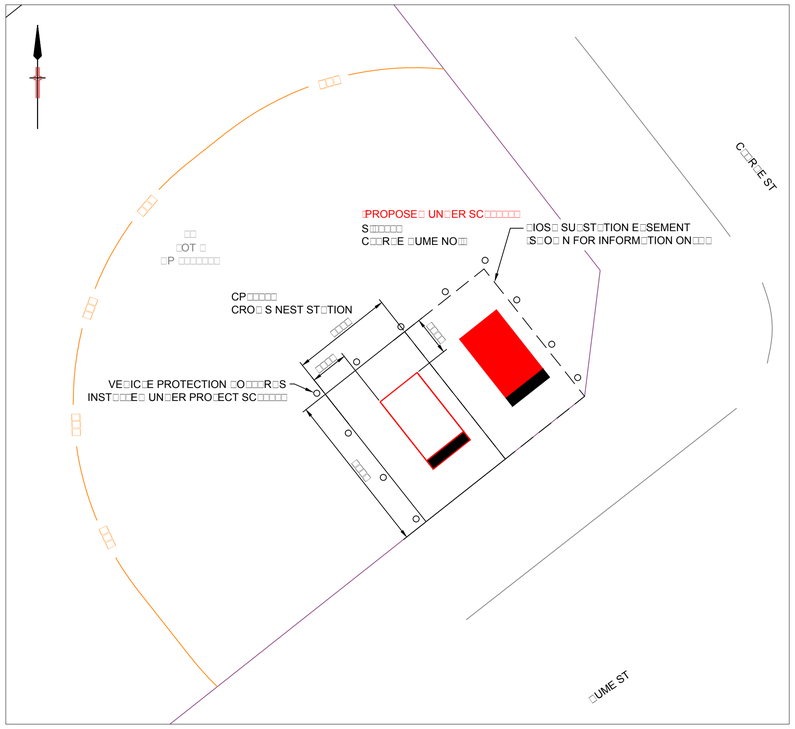
ASSOCIATED DRAWINGS

CERTIFICATION NUMBER 1033960/20170602

EST□□□IS□ □□□V □VC
FOR S□□NE□ METRO
CRO□ S NEST ST□TION
□□ C□□R□E ST
CRO□ S NEST

SIZE □□ | AUSGRID PROJECT No. SC□□□□□ | SHEETS □ of □ | AMD. □

CAD DRAWING | AMENDMENTS



HVC LAYOUT AND RESTRICTION ZONE

SC□□E □□□□

SCALE 1 : 100

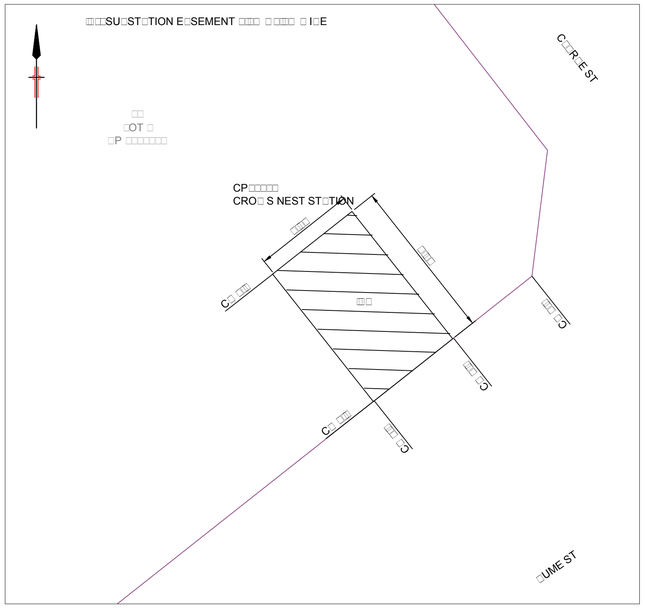
0 4 8 METRES

2 6 10

□□□ RESTRICTION □ONE □MUST NOT CONT□IN FIRE □□□R□NTS□

SEGREG□TION RE□UIREMENTS

T□E □VC □OUSING MUST □E □OC□TE□ □ MINIMUM □□□ FROM FIRE □□□R□NTS□



EASEMENT DIAGRAM

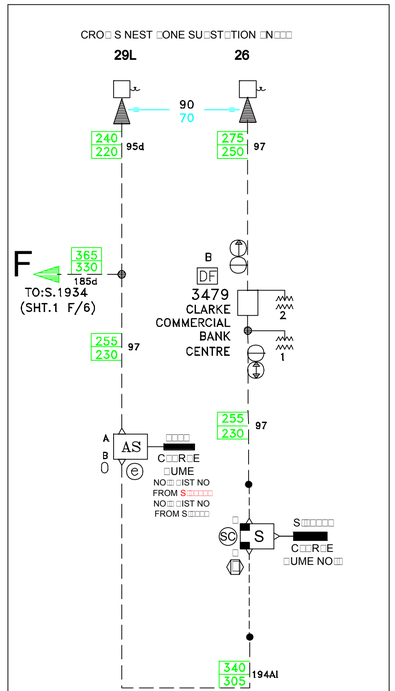
SC□□E □□□□

SCALE 1 : 100

0 4 8 METRES

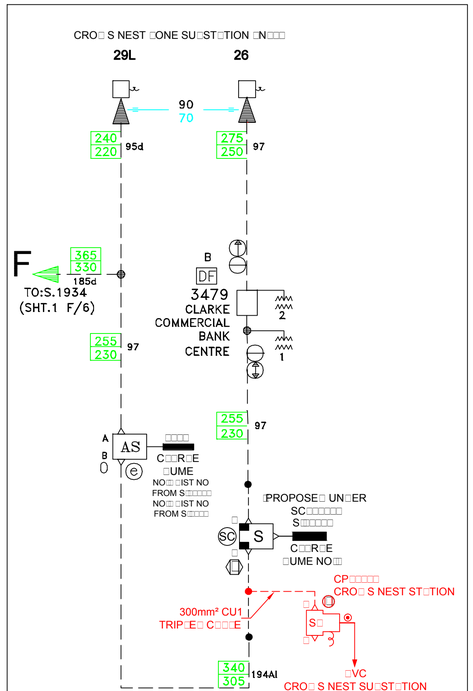
2 6 10

□□□E□SEMENT FOR □IOS□ SU□ST□TION □□□□ □ □□□□
□TO □E COMP□IE□ □ IT□ NS□□□
□NO STRUCTURES OR SERVICES □□□O□ E□□



EXISTING HV-SCHEMATIC DIAGRAM

NOT TO SC□□E



PROPOSED HV-SCHEMATIC DIAGRAM

NOT TO SC□□E

SUBSTATION CP78013 ELEVATION

SECTION □□□
SC□□E □□□□

SECTION □□□
SC□□E □□□□

UNDERGROUND CONSTRUCTION WORKS SCHEDULE

REF. IDENTIFIER	ROUTE DISTANCE (m)	CIRCUIT VOLTAGE	CONDUCTOR OR ASSET DETAIL	CABLE CODE	MIN. INTERNAL BENDING RADIUS (mm) DURING INSTALLATION	MIN. INTERNAL BENDING RADIUS (mm) AFTER INSTALLATION	CALCULATED MAX. PULLING TENSION (kN) DURING INSTALLATION	CONSTRUCTION DETAIL
SU□ST□TION □ OR□S								
□	N□□	□□□V	□ □□VC □IOS□ SU□ST□TION CP□□□□□	N□□	N□□	N□□	N□□	□INST□□□ □□□VC □IOS□ CP□□□□□ USING SC□NEI□ER E□ECTRIC I□I RMIC□[1]□ □INST□□□ □IOS□ PIERS IN □CCOR□□NCE □ IT□ □USGRI□ □R□□ ING □□□□□□□ □INST□□□ □IOS□ E□RT□ GRI□ IN □CCOR□□NCE □ IT□ NS□□□ □N□ T□E E□RT□ GRI□ SPECIFIC□TION ON T□IS □R□□ ING□ □INST□□□ OVER□URRENT □N□ E□RT□ F□U□T RE□□□ □□□□ CO□□□ON T□E PROTECTION P□NE□-[2]□ □□IOS□ SITE SURF□CE TO □E FINIS□E□ □ IT□ □□UE MET□□□□□□ N GR□□S□PINE □□R□ □ OO□C□IPS OR P□VERS ON□□□ NOTE□□ NOMIN□□ □□□V □C □□□ SING□E P□□SE □ □□V □□CU□ □ □ □□□□□□S□□□□ □E PROVI□E□ □□ T□E □EVE□OPER'S E□ECTRIC□□ CONTR□CTOR FROM T□E CUSTOMER'S M□IN □O□ VO□T□GE S□ ITC□□O□R□ □N□ INST□□□E□ □□ NOMIN□TE□ □EVE□ □ □SP □ IT□IN T□E NE□ □VC □S PER C□□USE □□□□□ IN NS□□□□
CIVI□ □ OR□S								
□ □□	□	N□□	OPEN TRENC□	N□□	N□□	N□□	N□□	E□C□V□TE TRENC□ □□□ FOR □IRECT □URI□□ OF C□□□E□□□C□FI□□ □S PER NS□□□ □N□ □OC□□ COUNCI□ RE□UIREMENTS□
□	N□□	N□□	□OINT □□□	N□□	N□□	N□□	N□□	E□C□V□TE □□ □N□ CRE□TE □ □OINTING □□□□
C□□□E INST□□□□TION								
□ □□	□	□□□V	□ □ □□□V □□□CU□TR□□ □□CU□□ S□□□□ TRIP□E□	□□□	□□□□	□□□	□IRECT □URIE□	□IRECT □UR□ □ □□□□V □□□CU□TR□□ □□CU□□ S□□□□ TRIP□E□ C□□□E □□□O□ □□ FOR TERMIN□TION □T □□□N□ □□ FOR □V □OINTING □T □□□
□OINTING □ OR□S								
□	N□□	□□□V	□ □RM□S□ ITC□GE□R TERMIN□TION □□V□□□□	□□□	N□□	N□□	N□□	TERMIN□TE □ □ □□□V □□□CU□TR□□ □□CU□□ S□□□□ TRIP□E□ C□□□E IN RM□S□ ITC□GE□R USING □V□□□ CONSTRUCTION□
□	N□□	□□□V	□ □TEE □OINT □□V□□□□	□□□□□□□	N□□	N□□	N□□	INST□□□TEE □OINT □□□□CU□TRIP□E□ ONTO □□□CU□TRIP□E□ C□□□E USING □V□□□ CONSTRUCTION□

NOTES TO THE TABLE

□□T□E ST□N□□R□ □□ □VC COMES □ IT□ I□I RM□□T□IS UNIT NEE□S TO □E UPGR□□E□ TO I□I RM□ □R□TE□ □T □□□ □MP□□ □EN OR□ERING □VC □OS□S□
□□□USGRI□ □R□□ ING □□□□□□ □M□ □IS OUT□OF□□TE□T□E □CTU□□ PROTECTION P□NE□□ I□□ □□VE □□□ CO□ INST□□E□ INSTE□□ OF C□G□□□PROTECTION SETTING □N□ COMMISSIONING OF T□E □VC □ I□□ □E C□RRIE□ OUT □□ □USGRI□□
□E□C□V□TION □ OR□S IN T□E VICINIT□ OF TREES□□N□ □IG OR USE V□CUUM E□C□V□TION □N□ REFER TO NUS□□□ FOR □ OR□ □ IT□IN TREE PROTECTION □ONE□
□E□C□V□TION □ OR□S IN T□E VICINIT□ OF □VE C□□ES□□N□ □IG OR USE V□CUUM E□C□V□TION □N□ REFER TO NS□□□ FOR □ OR□ING NE□R OR □ROUN□ UN□ERGROUN□ C□□□ES□
□M□□IMUM □□□O□ □□□E PU□ING TENSION OF □□□ CU□TR□□ □□CU□□ S□□ □□ □TRIP□E□ □ □□□□N □S PER NS□□□□STOC□ING GRIP□MET□O□ IS USE□ TO C□□CU□□TE T□E PU□ING TENSION□
□□□□ TRENC□ES □N□ □OINT □□□S TO □E □C□FI□E□ IN □CCOR□□NCE □ IT□ NS□□□□
□□□□ FOOTP□T□ □N□ RO□□ E□C□V□TIONS □RE TO □E RESTORE□ TO □OC□□ GOVERNMENT OR □UT□ORIT□ □IRECTION□

CAD DRAWING	AMENDMENTS
□□□□□□□□	

ASSOCIATED DRAWINGS

PREPARED BY: UEA □□□ □□□□□□□□□ □□□

ASP REF. □□□□□□ □□□□□□□□□

DESIGNED BY	PETER □IONG
AUTH NO.	□□□□□□
SUBMIT DATE	SU□MITTE□ □□□□□□□□
LGA	NORT□ S□□NE□
MAP REF.	□□F□□
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□

EST□□□IS□ □□□V □VC
FOR S□□NE□ METRO
CRO□ S NEST ST□TION
□□C□□R□E ST
CRO□ S NEST

CERTIFICATION NUMBER 1033960/20170602

SIZE	AUSGRID PROJECT No.	SHEETS	AMD.
□□	SC□□□□□	□ of □	□

© □□□□□□□□

Address all relevant correspondence to:

Ausgrid Contestability Section
Building 3, 51-59 Bridge Road
Hornsby NSW 2077

E: Contestability@ausgrid.com.au

21/11/2017

UEA Electrical
Attention: Peter Xiong
5/2 Southridge St
Eastern Creek Nsw 2766

Email: pxiong@uea.com.au

Project Number: SC09404

Dear Peter,

Electricity Network Relocation Application at: 511 - 519 Pacific Hwy Crows Nest

Ausgrid has certified the electrical design plan(s) SC09404 amendment 0. The certification number for this design is 1034382/20171121. In providing this certification, Ausgrid makes no warranty, express or implied that the design is fit for the intended purpose or is suitable for the site conditions. The certification is provided exclusively on the basis of the design submitted without reference to any underlying assumptions or conditions and in accordance with the Design Contract Connection Assets.

The certified design plans have been forwarded electronically to your email address for your use.

The Applicant will be notified of the drawing certification and the conditions that must be met for the project to proceed to the next stage.

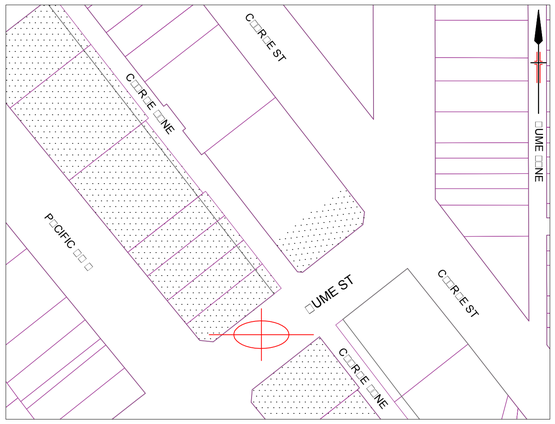
Should you require any further information please contact me on the phone number or email address detailed below.

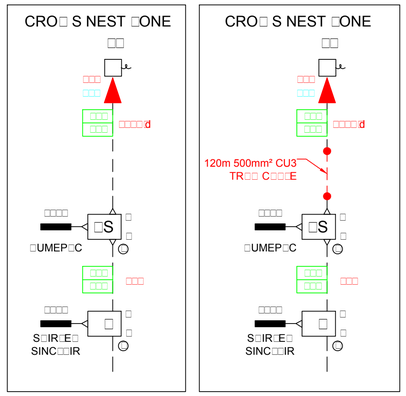
Yours sincerely,

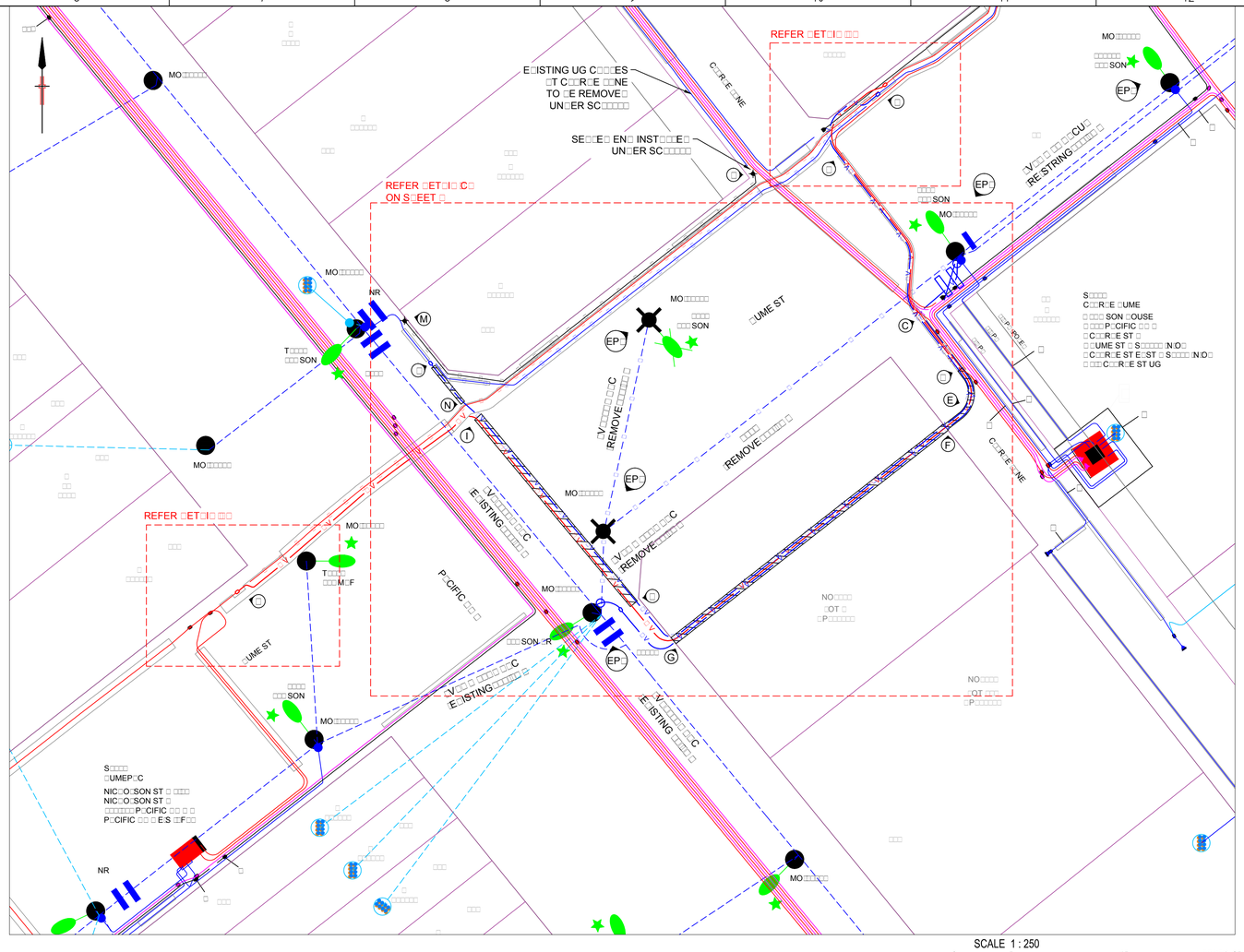
Shanming Zhou
Contestability Project Coordinator
Ausgrid

Direct Telephone Number: 9477 8357
Email: szhou@ausgrid.com.au

Encl: Drawing SC09404 Certified Design amendment 0







LOCALITY MAP

NOT TO SCALE

▨ PROPERTIES TO BE DEMOLISHED (□□ T□NS□)

EXISTING
HV-SCHEMATIC DIAGRAM

NOT TO SCALE

PROPOSED
HV-SCHEMATIC DIAGRAM

NOT TO SCALE

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH AUSGRID'S NETWORK STANDARDS.
2. ACCREDITED DESIGNER IS TO BE CONTACTED REGARDING ISSUES RAISED WITH THIS DESIGN. UEA ELECTRICAL CAN BE CONTACTED BY PHONE ON [illegible] OR BY FAX [illegible]
3. CLAIMS FOR VARIATIONS TO THE COST OF NON-CONTESTABLE WORKS (INCLUDING ROCK EXCAVATION) WILL NOT BE ACCEPTED UNLESS VERIFIED ON SITE BY THE AUSGRID [illegible] WHILE THE WORKS ARE IN PROGRESS.
4. THE ASP IS RESPONSIBLE FOR UNDERTAKING SATISFACTORY CONSULTATION WITH ALL LOCAL CUSTOMERS WHO MAY POTENTIALLY BE AFFECTED BY THE CONSTRUCTION WORKS INCLUDING ANY ALTERATIONS TO SERVICE MAINS.
5. THE ASP MUST MINIMISE THE IMPACT OF THE WORKS ON THE ELECTRICITY SUPPLY TO CUSTOMERS AND INTERRUPTIONS TO SUPPLY MUST BE AVOIDED WHERE EVER POSSIBLE. AT LEAST FOUR [illegible] CLEAR BUSINESS DAYS NOTICE MUST BE PROVIDED TO ALL AFFECTED CUSTOMERS PRIOR TO ANY PLANNED INTERRUPTIONS TO THE ELECTRICITY SUPPLY. NOTICE MUST BE IN WRITING IN ACCORDANCE WITH CLAUSE [illegible] OF THE NATIONAL ENERGY RETAIL RULES.
6. SPECIFIC PRIOR APPROVAL MUST BE SOUGHT FROM AUSGRID FOR ANY PLANNED ELECTRICITY SUPPLY INTERRUPTIONS WHERE THE PLANNED INTERRUPTION WILL EXCEED ONE [illegible] HOUR IN DURATION OR THE DURATION WILL BE LESS THAN ONE HOUR BUT A SUITABLE TIME FOR THE INTERRUPTION CANNOT BE MUTUALLY AGREED TO WITH THE AFFECTED CUSTOMERS.
7. THE ASP IS TO MAINTAIN ADEQUATE PUBLIC LIGHTING LEVELS FOR THE DURATION OF THE WORKS. IF NECESSARY, THE ASP IS TO ARRANGE FOR SUITABLE TEMPORARY STREET LIGHTING TO BE PROVIDED UNTIL PERMANENT LIGHTING IS RE-ESTABLISHED.
8. LEVEL [illegible] ASP IS TO CONTACT DIAL BEFORE YOU DIG ON [illegible] AT LEAST TWO [illegible] DAYS PRIOR TO COMMENCEMENT OF WORKS. ALL SERVICES ADJACENT TO EXCAVATIONS ARE TO BE LOCATED AND IDENTIFIED PRIOR TO EXCAVATION.
9. ALL FOOTPATH AND ROAD EXCAVATIONS ARE TO BE RESTORED TO LOCAL GOVERNMENT OR AUTHORITY DIRECTION. CONTACT LOCAL GOVERNMENT OR AUTHORITY PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORKS.
10. [illegible] LEVEL [illegible] ASP WORK DEPICTED ON THIS DRAWING IS SHOWN FOR INFORMATION PURPOSES ONLY AND DOES NOT FORM PART OF THE CERTIFIED DESIGN.
11. THIS INFORMATION INCLUDES DATA FROM THE NSW DIGITAL CADASTRAL DATABASE BY LAND AND PROPERTY INFORMATION © 2016, USED UNDER CREATIVE COMMONS LICENCE VERSION [illegible]
12. FOR IDENTIFICATION AND JOINTING PURPOSES, ALL CABLE ENDS SHALL BE LABELLED AT THE TERMINATION LOCATIONS AND IN JOINT BAYS DURING CABLE INSTALLATION. THE CABLES MUST BE LABELLED AS PER CERTIFIED DESIGN DRAWING.
13. THE ASP IS REQUIRED TO COMPLY WITH THE CORRECT PROCEDURES FOR WORKING WITH AND/OR NEAR ASBESTOS MATERIALS (REFER TO AUSGRID NUS[illegible] WORKING WITH ASBESTOS PRODUCTS). FOLLOWING EXISTING ASSETS MAY CONTAIN ASBESTOS:
    EXISTING CONDUITS ARE SPECIFIED AS [illegible] FC WHICH ARE [illegible] FIBRE CEMENT CONDUITS AND MAY CONTAIN ASBESTOS.

WARNING

- THIS DRAWING CANNOT BE USED FOR CONSTRUCTION PURPOSES UNTIL THE LOCATION OF ALL EXISTING SERVICES IS VERIFIED.
- THE INFORMATION PROVIDED IN THIS DESIGN MUST BE CHECKED ON SITE AND THE MOST CURRENT INFORMATION ON THE CONFIGERATION OF ALL SERVICES, INCLUDING AUSGRID'S NETWORK, MUST BE VERIFIED IMMEDIATELY BEFORE CONSTRUCTION COMMENCES BY CONTACTING DIAL BEFORE YOU DIG BY TELEPHONE ON [illegible] OR AT [illegible]
- DIAL BEFORE YOU DIG INFORMATION MUST NOT BE OLDER THAN [illegible] BUSINESS DAYS AT THE TIME OF CONSTRUCTION.

CONSTRUCTION PLAN

SC□□E □□□□□

DETAIL A

SC□□E □□□□□

DETAIL B

SC□□E □□□□□

LEGEND

	PROPOSED	EXISTING
P□□□	○	●
S□ S□□□d□rd	▣	▣
P□□□r S□□□d□rd	⊘	⊘
□V P□□□r	□	■
□V □□□□ P□□□r	☒	☒
S□□□□□□□	⬭	⬬
S□□□□□□□□PEC	⬭☆	⬬★
S□□□□□□□□□r□□□□□□□ □□□		◐
UGO□ □r R□□□r	○	●
P□□E□d	◁	◀
□□□□□	⬭	⬬
□V □□□□□	○	●
□V Tr□□□□	♣	♣
□V □□□□□	○	●
S□ □□□□□	○	●
E□r□□ □□□□□	○	●
I□□□ □□ □□ R□□ □□□d	□	

	PROPOSED	EXISTING
P□□□□□ □□ r□□ □□□d		●
US□ □□□□□□	▯▯	▮▮
US□ □□□□□d□	▯▯	▮▮
□□S	◁	◀
I□T	▯	▮
□□□□□S□□	▭	■
C□□□ □□r S□□	□	■
S□□□□d E□d	◁	◀
C□□□□ T□r□ □□□□□□	◁	◀
□□□□□□r□ □□□□□	○	●
C□□□□ □□ □□ r□□ □□□d		✕
O□□□ P□□□□	□	□
S□r□□□M□r□		△
PEC	☆	★
E□r□□□□ E□□□r□d□	⊕	

PROPOSED		EXISTING		REMOVE	
C□□d□□□ ▨		C□□d□□□ ▭			
O□ □□□□□	UG C□□□□□	O□ □□□□□	UG C□□□□□	O□ □□□□□	UG C□□□□□
HV	HV			X	X
LV	LV			X	X
SL	SL			X	X
SV	SV			X	X
TR132	TR132			X	X
TR33	TR33			X	X
AUX	AUX			X	X
E	E			X	X
□	□ □TER				
G□S	G□S				
S	SE□ ER				
S□	STORM□ □TER				

DESIGNED BY	PETER □IONG
AUTH NO.	□□□□□□□
SUBMIT DATE	□□□□□□□□□□
LGA	NORTH SYDNEY
MAP REF.	MAP □□ □□□
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□□
ASP REF.	□□□□□□□□□□□□□□□□□

ASSOCIATED DRAWINGS

CERTIFICATION NUMBER 1034382/20171121

RELOCATION OF OH MAINS
HUME ST
CROWS NEST

SIZE □□

AUSGRID PROJECT No. SC□□□□□

SHEETS □ of □

AMD. □

CAD DRAWING

AMENDMENTS

DESIGNED BY	PETER □IONG
AUTH NO.	
SUBMIT DATE	
LGA	NORT□ S□□NE□
MAP REF.	M□P
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□□

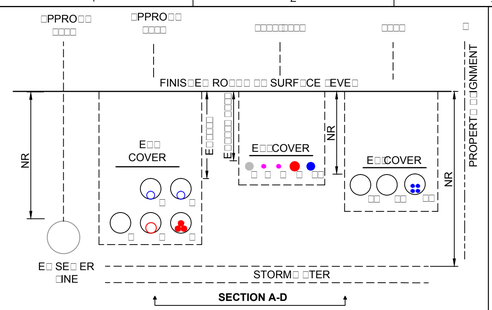
RE□OC□TION OF O□ M□INS
□UME ST
CRO□ S NEST

ASSOCIATED DRAWINGS

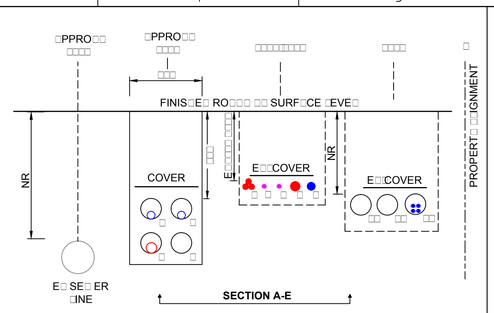
CERTIFICATION NUMBER 1034382/20171121

AUSGRID PROJECT No. SC□□□□□

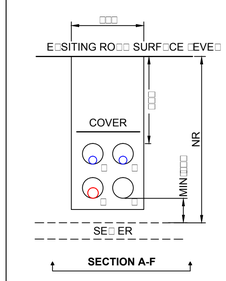
SHEETS □ of □



□ □E□ISTING SP□RE □□□□ □ CON□UIT
□ □NE□ □□□V □□□ CU□TR□□ □□ CU□□ S□□ □□ IN E□ISTING □□□□ □ CON□UIT
□ □E□SITING □□□V □□□ CU□□TRIP□E□ C□□□E IN E□ISTING □□□□ □ PVC CON□UIT □INST□□□E□ UN□ER SC□□□□□□
□ □NE□ □□□V □□□ CU□ □□ □ C□□□E IN E□ISTING □□□□ □ CON□UIT
□ □NE□ □□□V □□□ CU□ □□ □ C□□□E IN E□ISTING □□□□ □ CON□UIT
□ □□□□N□ONE□ □□□V □□□ □□□P □S□ □C□□□E TO □E REMOVE□ UN□ER PRO□ECT SC□□□□□
□ □E□ISTING □□□CU□ □ □ □N□ □TR C□□□E □IRECT □URIE□
□ □E□ISTING □□□CU□ □ □ □N□ □TR C□□□E □IRECT □URIE□
□ □E□ISTING □□□V □□□ □□□P □S□ □C□□□E □IRECT □URIE□
□□ □E□ISTING □□□V □□□ □□□P □S□ □C□□□E □IRECT □URIE□
□□ E□ISTING SP□RE □□□□ □ FC CON□UIT
□□ E□ISTING SP□RE □□□□ □ FC CON□UIT
□□ □E□ISTING SP□RE □□□□ □ FC CON□UIT
□□ □E□ISTING □□□V □□□ □□□ □ □ □□C□□□ES □ □□□ □□□ □ □C□□□ES IN E□ISTING □□□□ □ FC CON□UIT
NOTE□□E□ISTING CON□UITS □□□ INST□□□E□ UN□ER PRO□ECT SC□□□□□

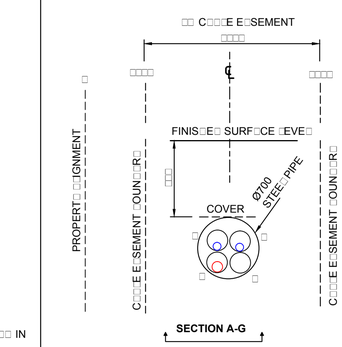


□ □NE□ □□□V □□□ CU□TR□□ □□ CU□□ S□□ □□ IN NE□ □□□□ □ CON□UIT
□ □NE□ SP□RE □□□□ □ PVC CON□UIT
□ □NE□ □□□V □□□ CU□ □□ □ C□□□E IN NE□ □□□□ □ CON□UIT
□ □NE□ □□□V □□□ CU□ □□ □ C□□□E IN NE□ □□□□ □ CON□UIT
□ □E□SITING □□□V □□□ CU□□TRIP□E□ C□□□E □IRECT □URIE□ □INST□□□E□ UN□ER SC□□□□□□
□ □E□ISTING □□□CU□ □ □ □N□ □TR C□□□E □IRECT □URIE□
□ □E□ISTING □□□CU□ □ □ □N□ □TR C□□□E □IRECT □URIE□
□ □E□ISTING □□□V □□□ □□□P □S□ □C□□□E □IRECT □URIE□
□□ E□ISTING SP□RE □□□□ □ FC CON□UIT
□□ □E□ISTING SP□RE □□□□ □ FC CON□UIT
□□ □E□ISTING □□□V □□□ □□□ □ □ □□C□□□ES □ □□□ □□□ □ □C□□□ES IN E□ISTING □□□□ □ FC CON□UIT



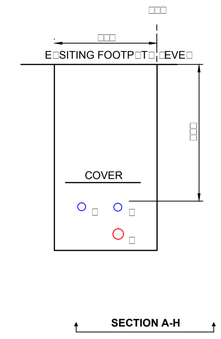
SECTION A-F

□ □NE□ □□□V □□□ CU□TR□□ □□ CU□□ S□□ □□ IN NE□ □□□□ □ CON□UIT
□ □NE□ SP□RE □□□□ □ PVC CON□UIT
□ □NE□ □□□V □□□ CU□ □□ □ C□□□E IN NE□ □□□□ □ CON□UIT
□□□□ □ CON□UIT
□ □NE□ □□□V □□□ CU□ □□ □ C□□□E IN NE□ □□□□ □ CON□UIT



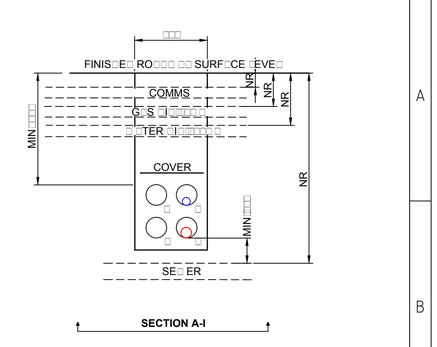
SECTION A-G

□ □NE□ □ □ □□□V □□□ CU□ □□ □ C□□□E IN NE□ □□□□ □ CON□UIT □□□
□ □NE□ SP□RE □□□□ □ CON□UIT □□□
□ □NE□ □ □ □□□V □□□ CU□ □□ □ C□□□E IN NE□ □□□□ □ CON□UIT □□□
□ □NE□ □ □ □□□V □□□ CU□ TR□□ □□ CU□□ S□□ □□ C□□□E IN NE□ □□□□ □ CON□UIT □□□
□□□□□□□ □ □IG□T □UT□ □□□UPVC □OR□NGE□ CON□UIT TO □S□N□S □□□□□□ INST□□E□ IN STEE□ PIPE



SECTION A-H

□ □NE□ □□□V □□□ CU□ □□ □ C□□□E □IRECT □URIE□
□ □NE□ □□□V □□□ CU□ □□ □ C□□□E □IRECT □URIE□
□ □ NE□ □□□V □□□ CU□TR□□ □□ CU□□ S□□ □□ C□□E□ □IRECT □URIE□



SECTION A-I

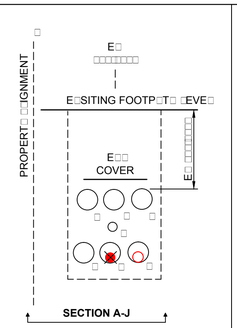
□ □SP□RE □□□□ □ PVC CON□UIT
□ □NE□ □□□V □□□ CU□ □□ □ IN NE□ □□□□ □ CON□UIT
□ □SP□RE □□□□ □ PVC CON□UIT
□ □NE□ □□□V □□□ CU□TR□□ □□ CU□□ S□□ □□ IN NE□ □□□□ □ CON□UIT

UNDERGROUND CONSTRUCTION WORKS SCHEDULE (PULLING TENSIONS SOFTWARE USED: ASP3 SPREADSHEET)

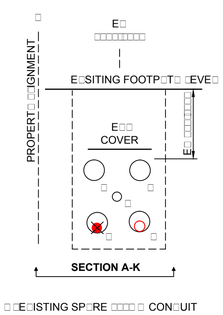
REF. IDENTIFIER	ROUTE DISTANCE (m)	CIRCUIT VOLTAGE	CONDUCTOR OR ASSET DETAIL	CABLE CODE/ STOCK CODE	MIN. INTERNAL BENDING RADIUS (mm) DURING INSTALLATION	MIN. INTERNAL BENDING RADIUS (mm) AFTER INSTALLATION	CALCULATED MAX. PULLING TENSION (kN) DURING INSTALLATION	CONSTRUCTION DETAIL
					CIVI□ □ OR□S			
□□□□□	N□□	N□□	□OINT □□□	N□□	N□□	N□□	N□□	E□C□V□TE □N□ CRE□TE □OINT □□□ FOR □OINTING
□ □□	□□	N□□	OPEN TRENC□ □OPEN POINT	N□□	N□□	N□□	N□□	E□C□V□TE TRENC□ FOR □IRECT □URI□□ OF C□□□ES □S PER SECTION □□□□E□POSE E□ISTING □□□□ □ PVC CON□UITS □INST□□□E□ UN□ER PRO□ECT SC□□□□□□□T □□FOR INST□□□TION OF C□□□ES□
EP□ □C	□	N□□	OPEN TRENC□ □OPEN POINT	N□□	N□□	N□□	N□□	E□C□V□TE TRENC□ FOR □IRECT □URI□□ OF C□□□ES □S PER SECTION □□□□E□POSE E□ISTING □□□□ □ PVC CON□UITS □INST□□□E□ UN□ER PRO□ECT SC□□□□□□□T □C□FOR INST□□□TION OF C□□□ES□
□ □E	□□□	N□□	OPEN POINT □□ □ □□□□ □ □□ □EG □□□□ R□□IUS PVC CON□UIT □EN□S □N RO□□□ □□□	N□□	N□□	N□□	N□□	E□C□V□TE TO E□POSE E□ISTING □□□□ □ PVC CON□UITS □INST□□□E□ UN□ER PRO□ECT SC□□□□□□□T □□FOR □OINTING OF NE□ CON□UITS□TRENC□ □N□ INST□□□ □ □ □□□□ □ PVC CON□UIT □EN□S USING □□□EG □N□ □□□□ R□□US □S PER SECTION □□E□□
E □F	□□□	N□□	□ □ □□□□ □ PVC CON□UITS □IN RO□□□ □□□	N□□	N□□	N□□	N□□	TRENC□ □N□ INST□□□ □ □ □□□□ □ PVC CON□UIT □S PER SECTION □□F□
F □G	□□□□	N□□	□ □ □□□□ □ PVC CON□UITS □IN SUPPORTING STRUCTURE□	N□□	N□□	N□□	N□□	INST□□□ □ □ □□□□ □ CON□UITS □S PER SECTION □□G□IN T□E NE□ SUPPORTING STRUCTURE NOTE□USE □□□□ □ □G□T □UT□ □□□UPVC □OR□NGE□CON□UIT TO □S□N□S □□□□□□REFER TO STURCTUR□□ CERTIFIC□TE FOR □ET□I□□
G □□	□	N□□	OPEN TRENC□	N□□	N□□	N□□	N□□	OPEN TRENC□ FOR □IRECT □URI□□ OF C□□□E □S PER SECTION □□□□
G □EP□	□	N□□	OPEN TRENC□	N□□	N□□	N□□	N□□	E□C□V□TE TRENC□ FOR □IRECT □URI□□ OF C□□□ES □S PER SECTION □□□□
□ □I	□□□□	N□□	□ □ □□□□ □ PVC CON□UIT □IN RO□□□ □□□□OPEN POINT	N□□	N□□	N□□	N□□	TRENC□ □N□ INST□□□ □ □ □□□□ □ PVC CON□UIT □S PER SECTION □□E□POSE E□ISTING □□□□ □ PVC CON□UITS □T □□FOR INST□□□□TION OF C□□□ES□
N □□	□	N□□	□ □ □□□□ □ PVC CON□UITS	N□□	N□□	N□□	N□□	TRENC□ □N□ INST□□□ □ □ □□□□ □ PVC CON□UIT □S PER SECTION □□□□□
					NE□ C□□□E INST□□□□TION			
□ □□	□□□	□□□V	□ □□□V □□□CU□TR□□ □□CU□□ S□□ □□ C□□□E	□□□□□□ □S□C□	□□□□	□□□□	□IRECT □URIE□	□IRECT □UR□ □ □□□V □□□ CU□TR□□ □□CU□□ S□□ □□ C□□□E □S PER SECTION □□□□E□POSE E□ISTING □□□□ □ PVC CON□UITS □T □□FOR C□□□E □OINTING□
□ □□	□□□	□V	□ □ □□□V □□□ CU□ □□ □ C□□□E	□□	□□□	□□□	□IRECT □URIE□	□IRECT □UR□ □ □□□V □□□ CU□ □□ □ C□□□E □S PER SECTION □□□□□□□O□ □□ □T □□FOR C□□□E □OINTING□
□ □G	□□	□□□V	□ □□□V □□□ CU□TR□□ □□CU□□ S□□ □□ C□□□E	□□□□□□ □S□C□	□□□□	□□□□	□□□	INST□□□ NE□ □ □ □□□V □□□ CU□TR□□ □□CU□□ S□□ □□ C□□□E IN NE□ □N□ E□ISTING □□□□ □ PVC CON□UIT □S PER SECTIONS □□C□□□□□□E□□□F□□N□ □□G□□
□ □G	□□	□V	□ □□□V □□□ CU□ □□ □ C□□□E	□□	□□□	□□□	□□□	INST□□□ NE□ □ □ □□□V □□□ CU□ □□ □ C□□□E IN NE□ □N□ E□ISTING □□□□ □ PVC CON□UIT □S PER SECTIONS □□C□□□□□□E□□□F□□N□ □□G□□
EP□□C	□	□V	□ □ □□□V □□□ CU□ □□ □ C□□□E	□□	□□□	□□□	□IRECT □URIE□	□IRECT □UR□ □ □□□V □□□ CU□ □□ □ C□□□E □S PER SECTION □□□□□□□O□ E□TR□ □□□ FOR UGO□ CONSTRUCTION ON EP□□□
C □G	□□	□V	□ □ □□□V □□□ CU□ □□ □ C□□□E	□□	□□□	□□□	□□□	INST□□□ NE□ □ □ □□□V □□□ CU□ □□ □ C□□□E IN NE□ □N□ E□ISTING □□□□ □ PVC CON□UIT □S PER SECTIONS □□□□□□□E□□□F□□N□ □□G□□
G □□□	□	□V	□ □ □□□V □□□ CU□ □□ □ C□□□E	□□	□□□	□□□	□IRECT □URIE□	□IRECT □UR□ □ □□□V □□□ CU□ □□ □ C□□□E □S PER SECTION □□□□□
□□ □EP□	□	□V	□ □ □□□V □□□ □□□ □□ □ □S□C C□□□E	□□□□	□□□	□□□	□IRECT □URIE□	□IRECT □UR□ □ □□□V □□□ □□□ □□ □ □S□C C□□□E □□□□O□ E□TR□ □□□ FOR UGO□ CONSTRUCTION ON EP□□□
G □□	□	□□□V	□ □□□V □□□ CU□TR□□ □□CU□□ S□□ □□ C□□□E	□□□□□□ □S□C□	□□□□	□□□□	□IRECT □URIE□	□IRECT □UR□ □ □□□V □□□ CU□TR□□ □□CU□□ S□□ □□ C□□□E □S PER SECTION □□□□□
G □□	□	□V	□ □ □□□V □□□ CU□ □□ □ C□□□E	□□	□□□	□□□	□IRECT □URIE□	□IRECT □UR□ □ □□□V □□□ CU□ □□ □ C□□□E □S PER SECTION □□□□□
□ □I □□	□□	□□□V	□ □ □□□V □□□ CU□TR□□ □□CU□□ S□□ □□ C□□□E	□□□□□□ □S□C□	□□□□	□□□□	□□□□	INST□□□ NE□ □ □ □□□V □□□ CU□TR□□ □□CU□□ S□□ □□ C□□□E IN NE□ □N□ E□ISTING □□□□ □ PVC CON□UIT □S PER SECTION □□I□□□□□ □N□ □□□□□□□O□ E□TR□ □□ FOR □OINTING □T □□□
□ □I	□□□□	□V	□ □ □□□V □□□ CU□ □□ □ C□□□E	□□	□□□	□□□	□□□	INST□□□ NE□ □ □ □□□V □□□ CU□ □□ □ C□□□E IN NE□ □□□□ □ PVC CON□UIT □S PER SECTION □□I□□
I □□	□	□V	□ □ □□□V □□□ CU□ □□ □ C□□□E	□□	□□□	□□□	□□□	INST□□□ NE□ □ □ □□□V □□□ CU□ □□ □ C□□□E IN NE□ □□□□ □ PVC CON□UIT □S PER SECTION □□□□□
					□OINTING □ OR□S			
EP□	N□□	□V	□ □ □V UGO□ □□V□□□□□	N□□	N□□	N□□	N□□	INST□□□ NE□ □V UGO□ □□V□□□□CONSTRUCTION ON E□ISTING PO□E MO□□□□□ □EP□□□N□ □ON□ TO TOP □V CIRCUIT OF E□ISTING OVER□E□□ M□INS □□□□□CU□□INST□□E□ □ET□ EEN PO□ES MO□□□□□ □N□ MO□□□□□
EP□	N□□	□V	□ □ □V UGO□ □□V□□□□□	N□□	N□□	N□□	N□□	INST□□□ □V UGO□ □□V□□□□CONSTRUCTION ON E□ISTING PO□E MO□□□□□ □EP□□□N□ □ON□ TO E□ISTING □□□□ □ □C C□□□E INST□□□E□ □ET□ EEN PO□ES MO□□□□□ □N□ MO□□□□□
□	N□□	□V	□ □ STR□IG□T T□ROUG□ □OINT □□V□□□□	□□□□□□□	N□□	N□□	N□□	INST□□□ □ □ □V STR□IG□T T□ROUG□ □OINT □□V□□□□ET□ EEN □□□V □□□ □□□ □□ □ S□C □N□ □□□ CU□ □□ □ C□□□ES
□	N□□	□□□V	□ □ STR□IG□T T□ROUG□ □OINT □□V□□□□	□□□□□□ □S□C□□□□	N□□	N□□	N□□	INST□□□ □ □ □V STR□IG□T T□ROUG□ □OINT □□V□□□□ET□ EEN □□□CU□TR□□ □□CU□□ S□□ □□ □N□ □□□ □□□ G TR□□ G □□CU□□ S□□ □□ C□□□ES
□□	N□□	□V	□ □ STR□IG□T T□ROUG□ □OINT □□V□□□□	□□□□□□□□	N□□	N□□	N□□	INST□□□ □ □ □V STR□IG□T T□ROUG□ □OINT □□V□□□□ET□ EEN □□□V □□□ □□□ □□ □ S□C □N□ □□□ CU□ □□ □ C□□□ES
□	N□□	□□□V	□ □ STR□IG□T T□ROUG□ □OINT □□V□□□□	□□□□□□ □S□C□□□□□	N□□	N□□	N□□	INST□□□ □ □ □V STR□IG□T T□ROUG□ □OINT □□V□□□□ET□ EEN □□□CU□TR□□ □□CU□□ S□□ □□ □N□ □□□ □□□ G TR□□ G □□CU□□ S□□ □□ C□□□ES
					□□□N□ON□REMOVE C□□□ES			
□ □□ □I □□	□□□□	□□□V	□□□V □ □ □□□ □□□G TR□□ G □□CU□□ S□□ □□ C□□□E	N□□	N□□	N□□	N□□	REMOVE RE□UN□□NT □V C□□□E
□ □□ □I □□	□□□□	□V	□□□V □ □ □□□□□□□□ □S□C C□□□E	N□□	N□□	N□□	N□□	REMOVE RE□UN□□NT □V C□□□E
□ □M	□□	□V	□□□V □□□ □□□P □□□N□□ □S□C	N□□	N□□	N□□	N□□	REMOVE RE□UN□□NT □V C□□□E

NOTES TO THE TABLE

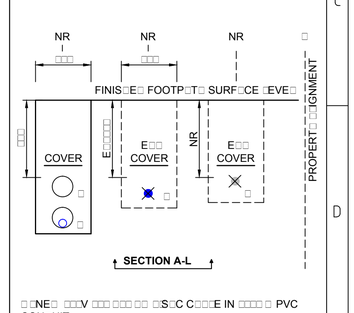
1. □USGRI□ PRO□ECT SC□□□□□ TO □E COMP□ETE□ PRIOR TO T□IS PRO□ECT□T□E □ OR□S PROPOSE□ UN□ER SC□□□□ □RE S□O□ N □S E□ISTING IN T□IS □ESIGN□
□□E□C□V□TION □ OR□S □RE IN T□E VICINIT□ OF E□ISTING □IVE C□□□ES□□□N□ □IG OR USE V□CUUM E□C□V□TION □N□ REFER TO NS□□□ FOR □ OR□ING NE□R OR □ROUN□ UN□ERGROUN□ C□□□ES□
□M□□IMUM □□O□ □□□E PU□□ING TENSION OF □□□ CU□ □□□ □ □ □□□N □S PER NS□□□□STOC□ING GRIP□MET□O□ IS USE□ TO C□□CU□□TE T□E PU□□ING TENSION□
□M□□IMUM □□□O□ □□□E PU□□ING TENSION OF□□□ CU□TR□□ □□CU□□ S□□ □□ □ □□□□N □S PER NS□□□□STOC□ING GRIP□MET□O□ IS USE□ TO C□□CU□□TE T□E PU□□ING TENSION□
□□□□ TRENC□ES □N□ OPEN POINTS TO □E □□C□FI□□E□ IN □CCOR□□NCE □ IT□ NS□□□□
□□□□ FOOTP□T□ □N□ RO□□ E□C□V□TIONS □RE TO □E RESTORE□ TO □OC□□GOVERNMENT OR □UT□ORIT□ □IRECTION□



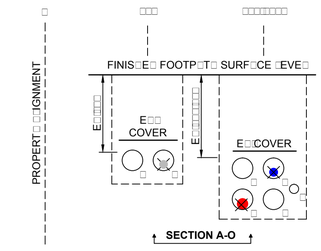
□ □E□ISTING SP□RE □□□□ □ CON□UIT
□ □E□ISTING SP□RE □□□□ □ CON□UIT
□ □E□ISTING SP□RE □□□□ □ CON□UIT
□ □E□ISTING SP□RE □□□□ □ CON□UIT
□ □E□ISTING SP□RE □□□□ □ CON□UIT
□ □REMOVE E□ISTING □□□V □□□ □□□G TR□□ G □□CU□□ S□□ □□ IN E□ISTING □□□□ □ CON□UIT
□ □NE□ □□□V □□□ CU□TR□□ □□CU□□ S□□ □□ IN E□ISTING □□□□ □ CON□UIT



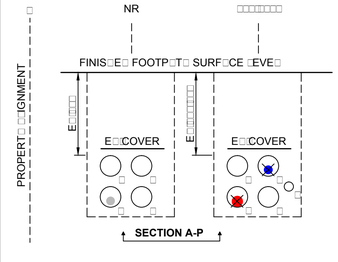
□ □E□ISTING SP□RE □□□□ □ CON□UIT
□ □E□ISTING SP□RE □□□□ □ CON□UIT
□ □E□ISTING SP□RE □□□□ □ CON□UIT
□ □REMOVE E□ISTING □□□V □□□ □□□G TR□□ G □□CU□□ S□□ □□ IN E□ISTING □□□□ □ CON□UIT
□ □NE□ □□□V □□□ CU□TR□□ □□CU□□ S□□ □□ IN E□ISTING □□□□ □ CON□UIT



□ □NE□ □□□V □□□ □□□ □□ □S□C C□□□E IN □□□□ □ PVC CON□UIT
□ □NE□ SP□RE □□□□ □ PVC CON□UIT
□ □REMOVE E□ISTING □IRECT □URIE□ □□□V □□□ □□□ □□ □S□C C□□□E
□ □REMOVE □□□N□ONE□ □□□V □□□ □□□P □□N□□ □S□C C□□□E IN □□□□ □ PVC CON□UIT
□ □□□□N□ONE□ UN□ER PRO□ECT SC□□□□□□



□ □E□ISTING SP□RE □□□□ □ PVC CON□UIT
□ □REMOVE □□□N□ONE□ □□□V □□□ □□□P □□N□□ □S□C C□□□E IN □□□□ □ PVC CON□UIT □□□□N□ONE□ UN□ER PRO□ECT SC□□□□□□□
□ □REMOVE □□□V □□□ □□□ G TR□□ G □□CU□□ S□□ □□ C□□□E IN □□□□ □ PVC CON□UIT
□ □E□ISTING SP□RE □□□□ □ PVC CON□UIT
□ □E□ISTING SP□RE □□□□ □ PVC CON□UIT
□ □E□ISTING SP□RE □□□□ □ PVC CON□UIT
□ □REMOVE □□□V □□□ □□□ □□ □S□C C□□□E IN □□□□ □ PVC CON□UIT
□ □E□ISTING SP□RE □□□□ □ PVC CON□UIT



□ □□□□N□ONE□ E□ISTING □□□V □□□ □□□ □□ CU□N□ □□ □S□C C□□□E IN □□□□ □ PVC CON□UIT □□□□N□ONE□ UN□ER PRO□ECT SC□□□□□□□
□ □E□ISTING SP□RE □□□□ □ PVC CON□UIT
□ □E□ISTING SP□RE □□□□ □ PVC CON□UIT
□ □E□ISTING SP□RE □□□□ □ PVC CON□UIT
□ □REMOVE □□□V □□□ □□□ G TR□□ G □□CU□□ S□□ □□ C□□□E IN □□□□ □ PVC CON□UIT
□ □E□ISTING SP□RE □□□□ □ PVC CON□UIT
□ □REMOVE □□□V □□□ □□□ □□ □S□C C□□□E IN E□ISTING □□□□ □ PVC CON□UIT
□ □E□ISTING SP□RE □□□□ □ PVC CON□UIT

CAD DRAWING
AMENDMENTS

ASSOCIATED DRAWINGS

DESIGNED BY	PETER □IONG
AUTH NO.	□□□□□□
SUBMIT DATE	□□□□□□□□□
LGA	NORT□ S□□NE□
MAP REF.	M□P □□ □□□
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□□

ASP REF. □□□□□□□□□□□□□□□□

CERTIFICATION NUMBER 1034382/20171121

RE□OC□TION OF O□ M□INS
□UME ST
CRO□ S NEST

SIZE □□ | AUSGRID PROJECT No. SC□□□□ | SHEETS □ of □ | AMD. □

OVERHEAD CONSTRUCTION WORKS SCHEDULE *(SOFTWARE USED: POLES N WIRES v6.23.631)*

REF□ I□ENTIFIER	PO□E NUM□ER	SI□E □□	STRENGT□ □N□	PO□E T□PE TIM□ER□CONC	□EPT□ □□	FOOTING □ET□□S	□V CONSTRUCTION CONST T□PE	□V CONSTRUCTION □TT□C□E□ □□ □FROM □E□□ OF PO□E	□V CONSTRUCTION CONST T□PE	□V CONSTRUCTION □TT□C□E□ □□ □FROM □E□□ OF PO□E	ST□□ □ET□□S ST□□ T□PE	ST□□ □ET□□S ST□□ SI□E	ST□□ □ET□□S □TT□C□E□ □□ □FROM □E□□ OF PO□E	ST□□ □ET□□S ST□□ □E□RING □□ □□□	N□□□□ VI□R□TION □□MPERS	N□□□□ □RMOUR RO□S	□□□ITION□□ CONSTRUCTION □ET□I□
EP□	MO□□□□□□	□□ □E□□	□ □□SSUME□□	TIM□ER □E□□	E□	E□	N□□	N□□	□V □□□□□	E□ □□□ □TOP CCT□	N□□	N□□	N□□	N□□	N□□	N□□	□REMOVE E□ISTING □□RE OVER□E□□ M□INS □TOP CCT □□□□□□□ET□ EEN □EP□□□EP□□□ □CONVERT E□ISTING TOP CIRCUIT CONSTRUCTION TO □□□□□ □□ RE□OC□TING T□E CROSS□□RM TO T□E OPPOSITE SI□E OF T□E PO□E □RESTRING E□ISTING □□RE O□ M□INS □TOP CCT □□□□□□□ET□ EEN PO□E □EP□□□N□ □EP□□MO□□□□□□□□ □RNING□□O NOT E□CEE□ E□ISTING CON□UCTOR STRINGING TENSION□ □NOTE□□TOP CIRCUIT SUPP□IE□ FROM SU□ S□□□□□□□VI□ □V UGO□ □T PO□E MO□□□□□ NE□R T□E CNR OF P□CIFIC □□ □ □N□ □UME ST□
									□□□□	E□ □□□ □□OTTOM CCT□							□REMOVE E□ISTING □□RE OVER□E□□ M□INS □□OTTOM CCT □□□□□□ET□ EEN EP□□ □EP□□ □CONVERT E□ISTING □OTTOM CIRCUIT CONSTRUCTION TO □□□□ □□ RE□OC□TING T□E CROSS□□RM TO T□E OPPOSITE SI□E OF T□E PO□E □RESTRING E□ISTING □□RE O□ M□INS □□OTTOM CCT □□□□□□ET□ EEN PO□E □EP□□□N□ □EP□□MO□□□□□□□□ □RNING□□O NOT E□CEE□ E□ISTING CON□UCTOR STRINING TENSION□ □NOTE□□OTTOM CIRCUIT SUPP□IE□ FROM SU□ S□□□□□□VI□ □V UGO□ □T PO□E MO□□□□□□ NOTE□□□SE□ ON PO□E TIP □O□□ C□□CU□□TIONS□T□E MINIMUM RE□UIRE□ □ OR□ING STRENGT□ OF T□E E□ISTING PO□E IS □□N□
EP□	MO□□□□□□	E□	E□	TIM□ER □E□□	E□	E□	N□□	N□□	REMOVE	E□	N□□	N□□	N□□	N□□	N□□	N□□	□REMOVE □□□ OVER□E□□ M□INS CONNECTE□ TO T□E PO□E □E□ISTING TE□ECOMMUNIC□TION C□□□E TO □E RE□OC□TE□ TO UN□ERGROUN□ NOTE□TE□ECOMMUNIC□TION PRO□ECT RECT REF□P□□□□□□□□□SSET RE□OC□TION□P□□□□□□□ □C□□□E □OC□TE CONT□CT□NE□□ SING□ EM□I□□NE□□SING□□ OPTUS□COM□U □REMOVE PO□E
EP□	MO□□□□□□	□□□ □E□□	□ □□SSUME□□	TIM□ER □E□□	E□	E□	N□□	N□□	□□□ □E□□ □□□ □E□□	E□	N□□	N□□	N□□	N□□	N□□	N□□	□REMOVE E□ISTING □V □□C M□INS □□□□□□ □ □□C□□ET□ EEN PO□ES EP□ □EP□□ □INST□□□ □V UGO□ □N□ □ON□ NE□ UN□ERGROUN□ C□□□E TO E□ISTING □□□□ □□C SP□N □ET□ EEN □EP□□MO□□□□□□□□N□ MO□□□□□□□ □V UGO□ TO □E INST□□□E□ ON T□E NON□TR□FFIC SI□E OF T□E PO□E□ NOTE□□□SE□ ON PO□E TIP □O□□ C□□CU□□TIONS□T□E MINIMUM RE□UIRE□ □ OR□ING STRENGT□ OF T□E E□ISTING PO□E IS □□N□
EP□	MO□□□□□□	E□	E□	TIM□ER □E□□	E□	E□	N□□	N□□	REMOVE	E□	N□□	N□□	N□□	N□□	N□□	N□□	□REMOVE □□□ OVER□E□□ M□INS CONNECTE□ TO T□IS PO□E □REMOVE □N□ RECOVER E□ISTING □□NTERN □N□ □R□C□ET □REMOVE PO□E

NOTES TO T□E T□□□E
□□□USGRI□ PRO□ECT SC□□□□□ TO □E COMMISSIONE□ PRIOR TO T□IS PRO□ECT□T□E □ OR□S PROPOSE□ UN□ER SC□□□□ □RE S□O□ N □S E□ISTING IN T□IS □ESIGN□
□□T□E □SP□IS C□UTIONE□ □G□INST POTENTI□□□□ □ □□□R□OUS PO□E TOP □O□□ C□□NGES T□□T M□□ OCCUR □URING T□E CONSTRUCTION OF T□IS PRO□ECT□CONSI□ER□TION MUST □E GIVEN TO T□E SUPPORTING OF PO□ES PRIOR TO T□E □ OR□ □EING C□RRIE□ OUT□
□□□ □ERE T□E STRENGT□ OF E□ISTING PO□ES □RE NOT □V□I□□□E□T□E □SP□IS RESPONSI□□E FOR □SSESSING T□E E□ISTING PO□ES TO CONFIRM IT CORRESPON□S □ IT□ T□E MINIMUM RE□UIRE□ STRENGT□ R□TING SPECIFIE□ IN T□E T□□□E □□OVE□

OVERHEAD MAINS STRINGING TABLE

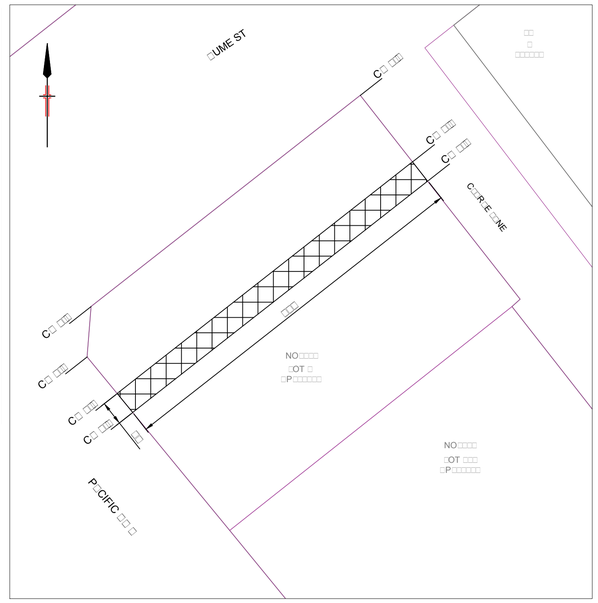
DESIGN SPAN:	MO□□□□□□ □EP□□	**TO**	MO□□□□□□ □EP□□	**RULING SPAN (m)**	□□□□	**VOLTAGE**		□□□V	
STRAIN POINTS:	MO□□□□□□ □EP□□	**TO**	MO□□□□□□ □EP□□	**CABLE TENSION**	□ □ UTS	**MAX.OPERATING TEMP**		□□ □ □□□C	
CABLE DETAIL:	□ □ □□ □□CU□				**CONDUCTOR CODE:**	□□□□□			
□M□IENT TEMP□	□	□	□□	□□	□□	□□	□□	□□	□□
TENSION □N □□ □□d□	□□□□□	□□□□□	□□□□□	□□□□□	□□□□□	□□□□□	□□□□□	□□□□□	□□□□□
S□G □□ □□	□□□□□	□□□□□	□□□□□	□□□□□	□□□□□	□□□□□	□□□□□	□□□□□	□□□□□
TIME □□□□	□□□□□	□□□□□	□□□□□	□□□□□	□	□	□□□□□	□□□□□	□□□□□

OVERHEAD MAINS CONDUCTOR DETAIL

REF□I□ENTIFIER	CIRCUIT VO□T□GE	N□□OF C□□□ES	CON□UCTOR T□PE	□E□□ EN□ SECTION □ENGT□ □□ □	TOT□□ C□□□E □ENGT□ □□ □
CABLE REMOVAL					
EP□ □EP□	□V	□	□ □ □□ □□CU□	□□□□	□□□□□
EP□ □EP□	□V	□	□ □ □□□□ □□C	□□□	□□□□
EP□ □EP□	□V	□	□□□□ □□C	□□□□	□□□□
CABLE RE-STRING					
EP□ □EP□	□V	□	□ □ □□ □□CU□	□□□□	□□□□□

STREET LIGHTING DESIGN DETAILS

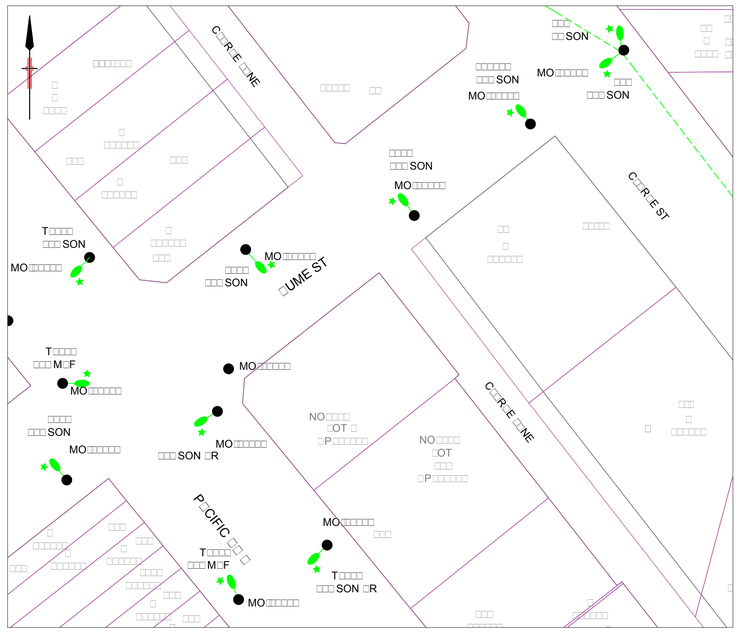
REF□ I□ENTIFIER	□SSET NUM□ER	T□RIFF	S□PO□E T□PE	CO□UMN SI□E □□ □	MOUNTING MET□O□	S□STEM CONSTRUCTION	CONNECTE□ P□□SE	CO□UMN CO□OUR	OUTRE□C□ R□C□ET T□PE	OUTRE□C□ □□ □	□EIG□T OF □UMIN□IRE □□ □	□UMIN□IRE T□PE	□UMIN□IRE SI□E □□ □	□UMIN□IRE REMOVE□ T□PE	□□□ITION□□ □ESIGN □ET□I□
EP□	MO□□□□□□		E□IST PO□E											□□□SON	REMOVE PO□E



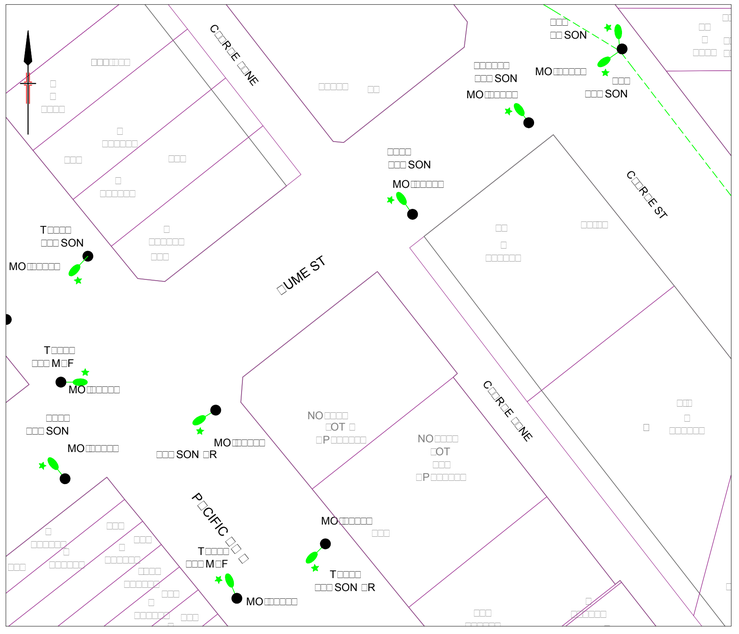
PROPOSED CABLE EASEMENT
SC□□E □□□□□

SCALE 1 : 250
0 5 15 METRES 25
10 20

E□SEMENT FOR C□□□E □□□ □ I□E□



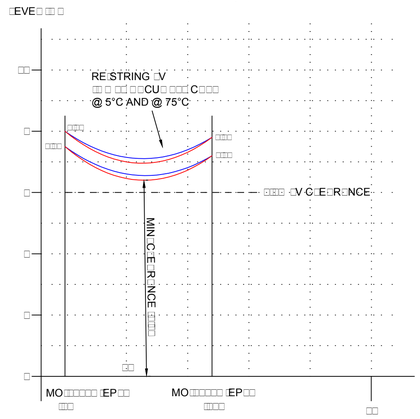
EXISTING SL-GEO-SCHEMATIC
NOT TO SC□□E



PROPOSED SL-GEO-SCHEMATIC
NOT TO SC□□E

LEGEND

5°C - (LV BARE) COLD
75°C - (LV BARE) HOT



LINE PROFILE FROM POLE MO-89470 TO MO-89469
VERT□SC□□E □□□□
□OR□SC□□E □□□□

SEGMENTS □ET□□S

STR□□IN SECTION	□	□
C□□d□□□□r	□□□□□C	□□□□□C
N□□C□□d□□□r□	□	□
S□r□T□□□□□□ □□C□□□	□	□
S□r□T□□□□□□ □N□	□□□□	□□□□
S□r□T□□□□□□	□□□□	□□□□
PO□ES	MO□□□□□□ MO□□□□□□	MO□□□□□□ MO□□□□□□
TEMPER□TURES	hot (75°C) standard (5°C)	hot (75°C) standard (5°C)

Pr□□□□SC□□□□□ □□UME ST□CRO□ S NEST
□ □□□ □□r□□□r□□□□□□□□□□□□□□□□□□□□PM
R□□□□□□ □r□d□□□d □□P□□□ □□□□ r□□□ □□□□□□□□□

SCALE 1 : 100
0 4 8 METRES
2 6 10

SCALE 1 : 500
0 20 40 METRES
10 30 50

C□EC□ FOR OT□ER SERVICES □EFORE □ORING OR E□C□V□TING

CAD DRAWING □□□□□□□□□
AMENDMENTS

ASSOCIATED DRAWINGS

UEA □□□ □□□□□□□□ □□□
ASP REF. □□□□□□□□□□□□□□□□

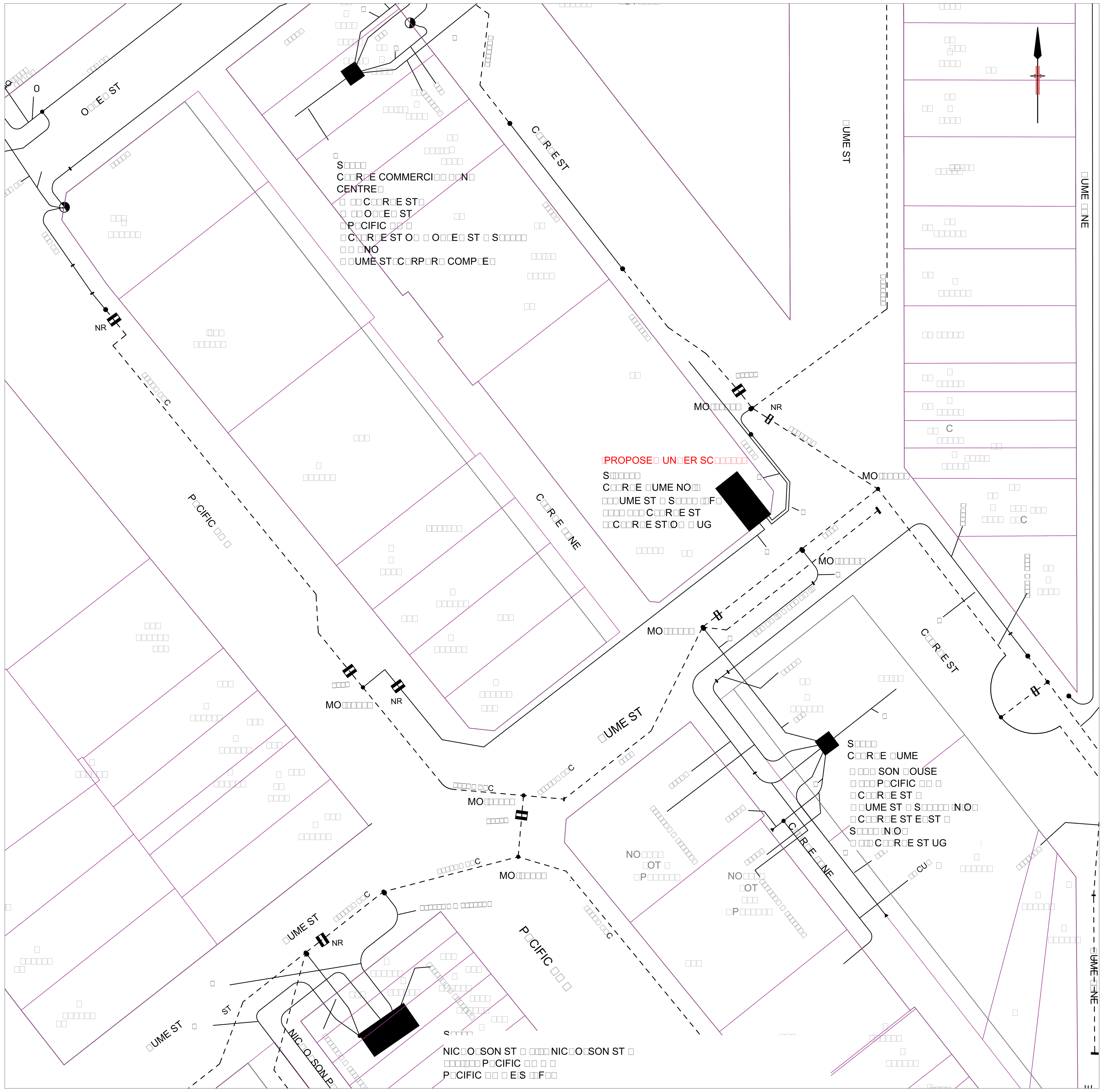
DESIGNED BY	PETER □IONG
AUTH NO.	□□□□□□□
SUBMIT DATE	□□□□□□□□□
LGA	NORT□ S□□NE□
MAP REF.	M□P □□ □□□
AUSGRID REF.	MO□□
PRJTRAK No.	□CC□□□□□□

RE□OC□TION OF O□ M□INS
□UME ST
CRO□ S NEST

CERTIFICATION NUMBER 1034382/20171121

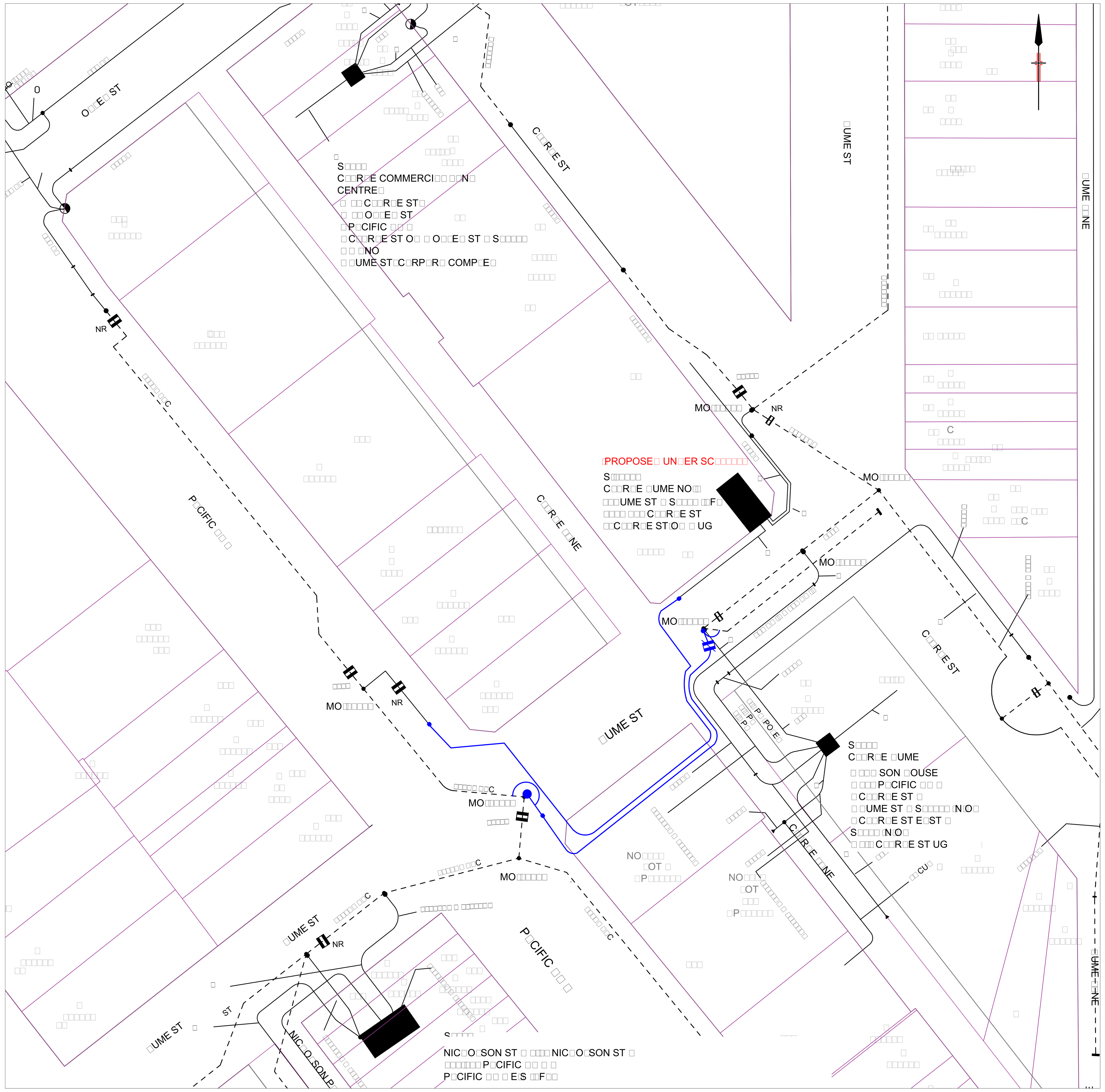
SIZE □□ | AUSGRID PROJECT No. SC□□□□□ | SHEETS □ of □ | AMD. □

© □□□□□□□□



EXISTING LV-GEO-SCHEMATIC

NOT TO SC□□E



PROPOSED LV GEO-SCHEMATIC

NOT TO SC□□E

DESIGNED BY	PETER □IONG
AUTH NO.	
SUBMIT DATE	
LGA	NORT□ S□□NE□
MAP REF.	M□P
AUSGRID REF.	MO□□
PRJTRAK No.	□CC

ASP REF.

CERTIFICATION NUMBER 1034382/20171121

RE□OC□TION OF O□ M□INS

□UME ST

CRO□ S NEST

SIZE | AUSGRID PROJECT No. SC□□□□□ | SHEETS □ of □ | AMD. □

Address all relevant correspondence to:

Ausgrid Contestability Section
Building 3, 51-59 Bridge Road
Hornsby NSW 2077

E: Contestability@ausgrid.com.au

11/04/2017

UEA Electrical
Attention: Peter Xiong
5/2 Southridge St
Eastern Creek Nsw 2766

Email: pxiong@uea.com.au

Project Number: SC09547

Dear Peter,

Electricity Network Relocation Application at: Clarke St Crows Nest - Lv Mains Replacement

Ausgrid has certified the electrical design plan(s) SC09547 amendment 0. The certification number for this design is 1050015/20170411. In providing this certification, Ausgrid makes no warranty, express or implied that the design is fit for the intended purpose or is suitable for the site conditions. The certification is provided exclusively on the basis of the design submitted without reference to any underlying assumptions or conditions and in accordance with the Design Contract Connection Assets.

The certified design plans have been forwarded electronically to your email address for your use.

The Applicant will be notified of the drawing certification and the conditions that must be met for the project to proceed to the next stage.

Should you require any further information please contact me on the phone number or email address detailed below.

Yours sincerely,

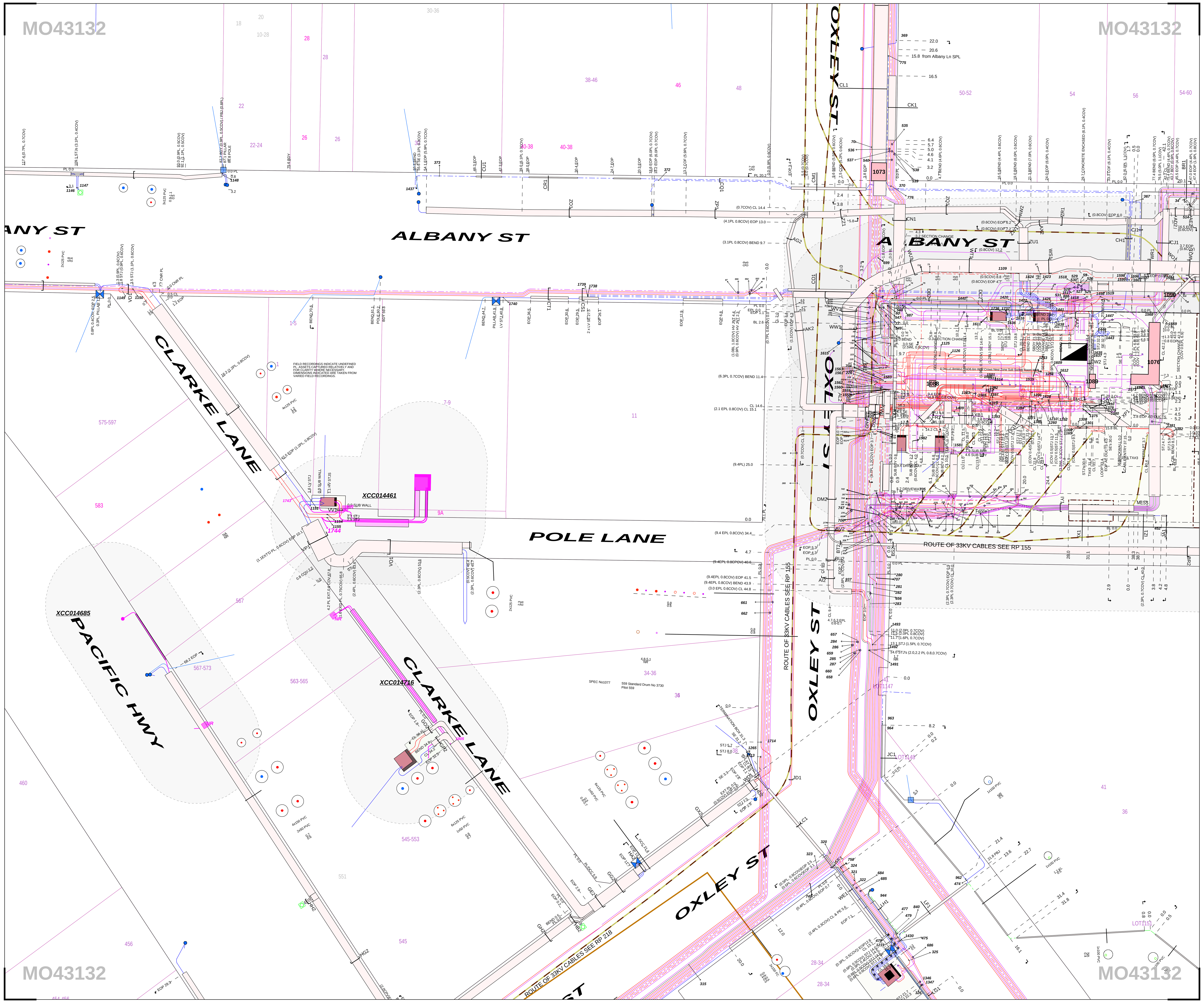
Shanming Zhou
Contestability Project Coordinator
Ausgrid

Direct Telephone Number: 9477 8357
Email: szhou@ausgrid.com.au

Encl: Drawing SC09547 Certified Design amendment 0

Appendix G

Dial Before You Dig Information (DBYD)



JOINT DETAIL REPORT

No.	Bk-Pg	Pl/Cvr	Joint Location
Map: MO431			
315		1.98/0.69	3.8 E OF CLARKE LN EPL

WARNING

Ausgrid's plans show the position of assets at the time of installation and may not account for subsequent changes to road alignments, fences or buildings. The plans show no more than the presence or absence of Ausgrid assets in the street.
Persons working near electricity networks must exercise care and will be held responsible for any damage caused.
You must excavate by hand or use vacuum excavation to establish the location of Ausgrid underground cables and associated assets.
Underground: Working near a cable may result in electric shock even if no contact is made. Any work in the vicinity of any cable should only be performed using safe work methods developed in accordance with the recommendations included in WorkCover Code of Practice for Excavation and WorkCover Guide for Work Near Underground Assets
as well as recommendations of Ausgrid's Network Standard NS156.
Overhead: Do not excavate near poles or towers until the stability of the foundation has been assessed by Ausgrid. Cables or earth conductors may be present close to substations, poles or towers.
Workers must maintain safe approach distances and follow applicable WorkCover Codes of Practice.
NOTE: 1. You must keep Ausgrid plans on site during excavation works. If the people actually performing the excavation works do not know how to read and interpret Ausgrid's plans, then the work must be directed by a person who knows how to read and interpret the plans. 2. This information includes data from the NSW Digital Cadastral Database by Land and Property Information (c) 2016, used under Creative Commons licence version 4.0.

ISG GRID

MO43131	MO43132	MO43141
MO43133	MO43134	MO43143
MO43311	MO43312	MO43321

GRID

21P11	21Q11	22A11
21P12	21Q12	22A12
21P13	21Q13	22A13

MO43132GMLA0

Distribution - 59404680

INFORMATION ON THIS PLAN ONLY VALID FOR 30 DAYS FROM ISSUE DATE

6 Mar 2017

Page 1 of 1

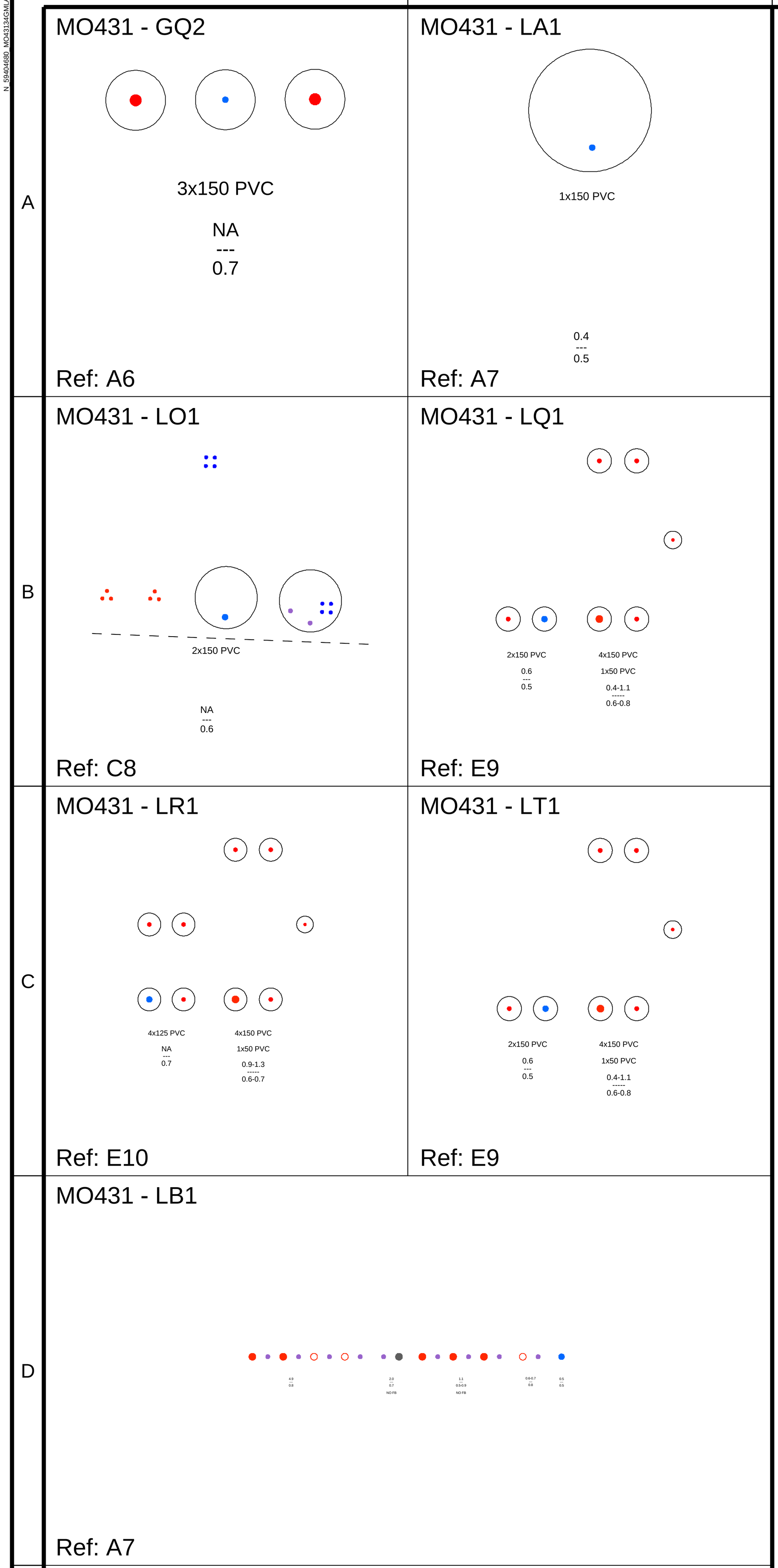
1:251

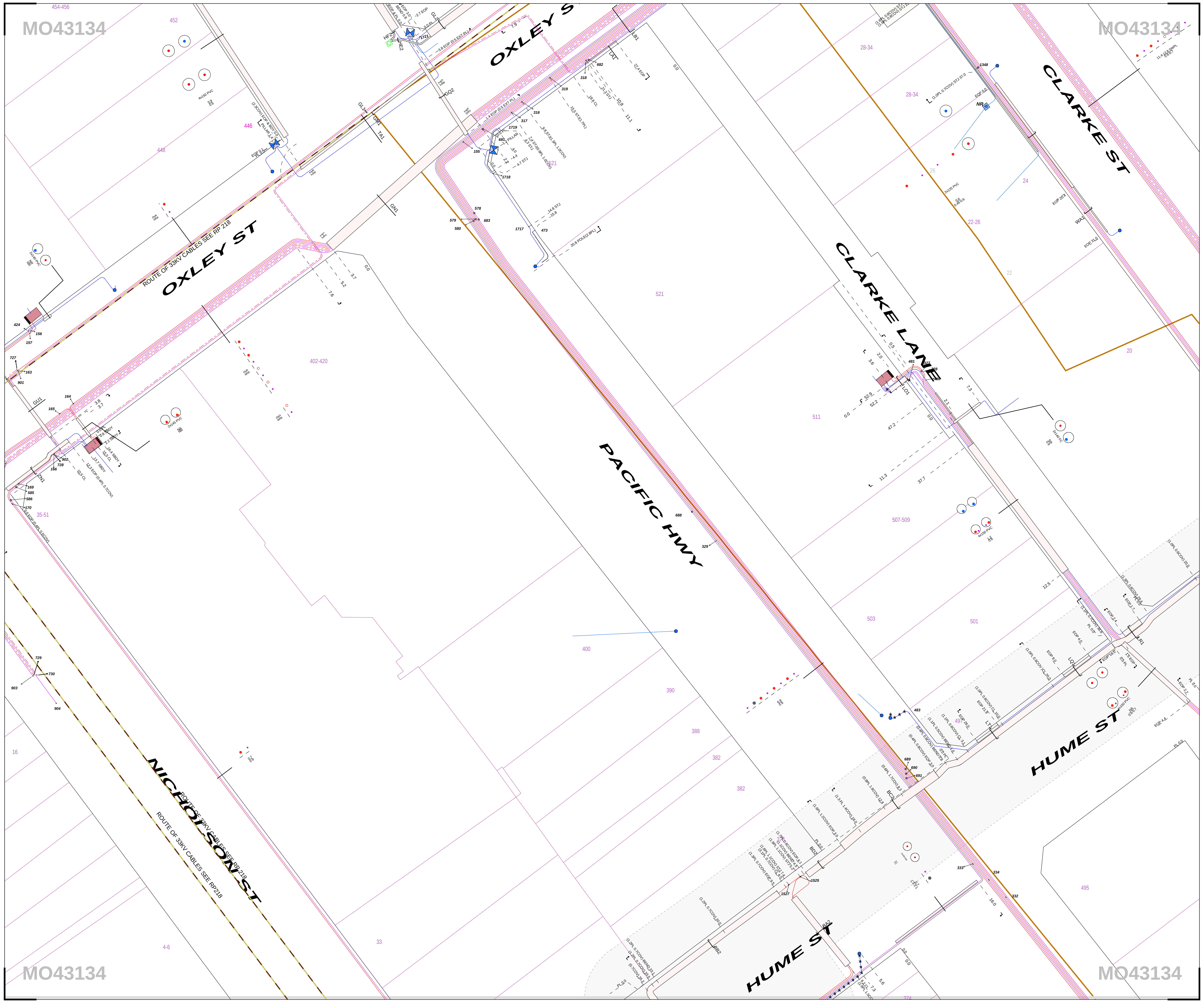
0 — 15 metres

N

Ausgrid

A0 MOCS_std_plot





JOINT DETAIL REPORT			
No.	**Bk-Pg**	**Pl/Cvr**	**Joint Location**
Map: MO431			
155	39-NR	1.60/0.76	1.6 SW OF PACIFIC HWY NEPL
316	38-NR	1.35/1.07	
317	38-NR	0.99/1.07	
318	260-56	0.61/0.76	
319	39-NR	1.75/0.46	
327	1252-26	3.15/0.71	51.7 NW OF HUME ST NWPL
328	1252-26	2.90/0.71	51.7 NW OF HUME ST NWPL
473	952-92	0.46/0.38	12.9 S OF OXLEY ST SPL
480	1971-58	1.78/0.76	3.2 SE OF KIOSK SEPL
481	1544-177	0.79/0.41	1.6 SE OF KIOSK SEPL
483	1181-91	0.51/0.41	9.4 NW OF HUME ST NWPL
578		6.25/0.76	7.9 S OF OXLEY ST SPL
579		6.48/0.76	8.8 S OF OXLEY ST SPL
580		6.65/0.76	8.8 S OF OXLEY ST SPL
681	291-NR	2.21/0.76	
682	260-56	0.46/0.76	
683		6.25/0.76	9.1 S OF OXLEY ST SPL
1717	LN14-0495	0.30/0.50	14.8 S OF OXLEY ST SPL
1718	LN14-0495	0.30/0.60	4.7 S OF OXLEY ST SPL
1719	LN14-0495	0.40/0.60	4.3 E OF PACIFIC HWY WPL

WARNING

Ausgrid's plans show the position of assets at the time of installation and may not account for subsequent changes to road alignments, fences or buildings. The plans show no more than the presence or absence of Ausgrid assets in the street.
Persons working near electricity networks must exercise care and will be held responsible for any damage caused.
You must excavate by hand or use vacuum excavation to establish the location of Ausgrid underground cables and associated assets.
Underground: Working near a cable may result in electric shock even if no contact is made. Any work in the vicinity of any cable should only be performed using safe work methods developed in accordance with the recommendations included in WorkCover Code of Practice for Excavation and WorkCover Guide for Work Near Underground Assets
as well as recommendations of Ausgrid's Network Standard NS156.
Overhead: Do not excavate near poles or towers until the stability of the foundation has been assessed by Ausgrid. Cables or earth conductors may be present close to substations, poles or towers.
Workers must maintain safe approach distances and follow applicable WorkCover Codes of Practice.
NOTE: 1. You must keep Ausgrid plans on site during excavation works. If the people actually performing the excavation works do not know how to read and interpret Ausgrid's plans, then the work must be directed by a person who knows how to read and interpret the plans. 2. This information includes data from the NSW Digital Cadastral Database by Land and Property Information (c) 2016, used under Creative Commons licence version 4.0.

MO43131	MO43132	MO43141	ISG GRID
MO43133	MO43134	MO43143	
MO43311	MO43312	MO43321	
21P11	21Q11	22A11	GRID
21P12	21Q12	22A12	
21P13	21Q13	22A13	

MO43134GMLA0

Distribution - 59404680

INFORMATION ON THIS PLAN ONLY VALID FOR 30 DAYS FROM ISSUE DATE

6 Mar 2017

Page 1 of 1

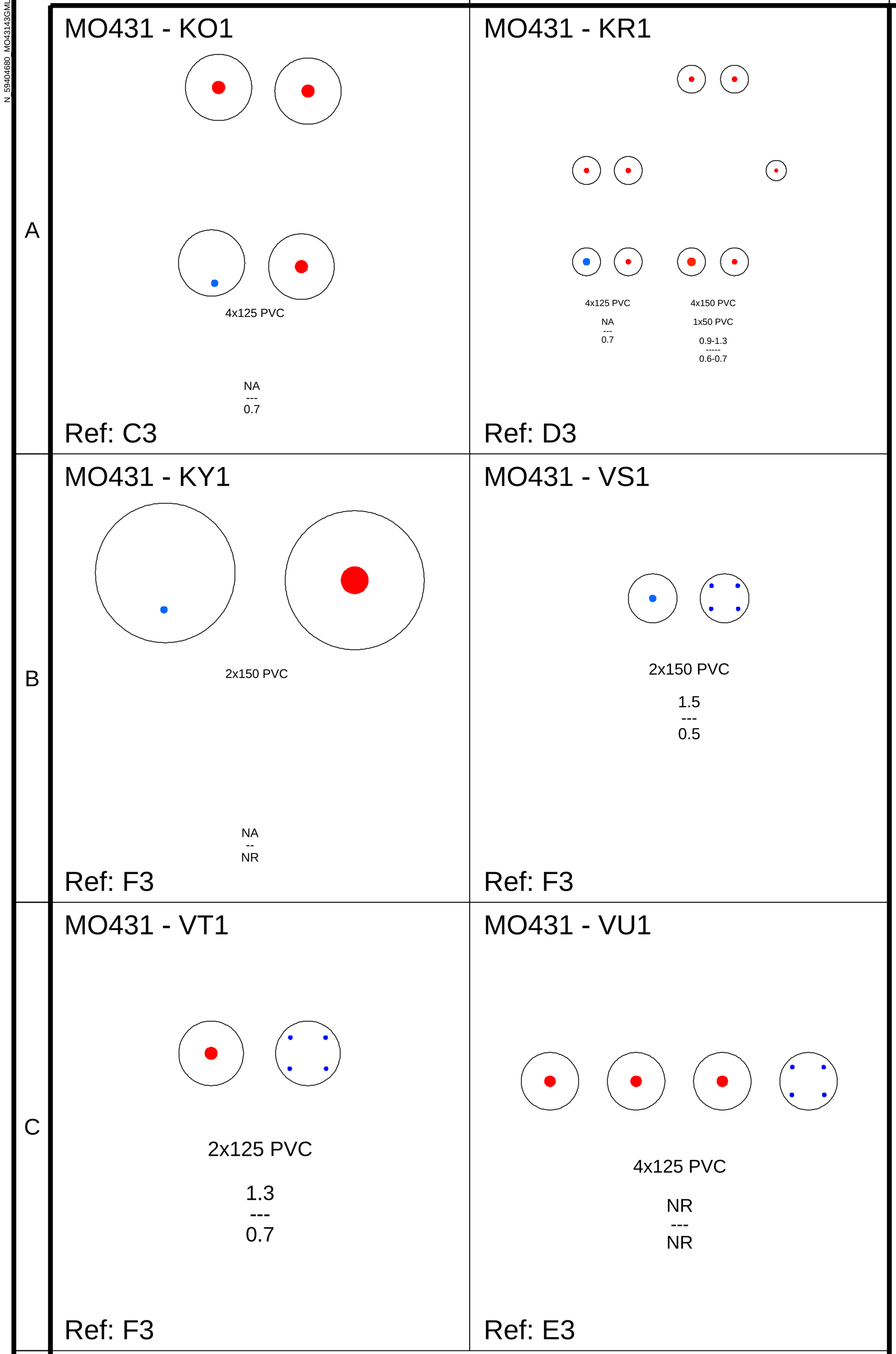
1:251

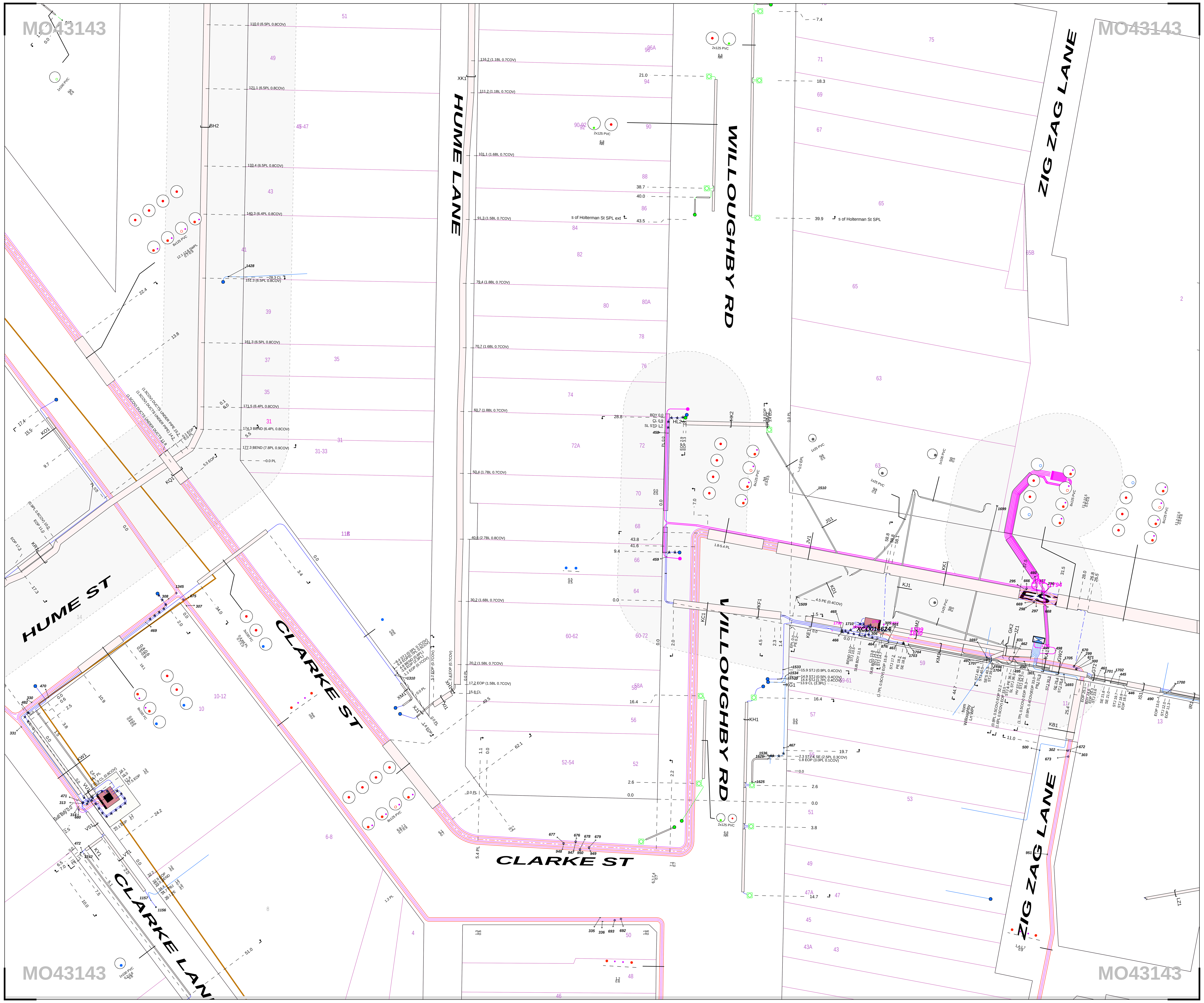
0 — 15 metres

N

Ausgrid

A0 MOCS_std_plot





JOINT DETAIL REPORT

No.	Bk-Pg	Pl/Cvr	Joint Location
Map: MO431			
308	655-29	0.76/0.61	1.0 SW OF CLARKE ST SWPL
313	649-46	1.75/0.61	16.0 SE OF HUME ST SEPL
314	649-46	1.98/0.61	16.0 SE OF HUME ST SEPL
330	1252-27	1.09/0.41	1.7 NE OF HUME LN NEPL
331	1252-27	1.09/0.41	0.6 SE OF HUME ST SEPL
469	1312-60	0.71/0.46	6.2 SW OF CLARKE ST SWPL
471	649-46	1.45/0.61	16.0 SE OF HUME ST SEPL
472	1854-85	0.51/0.51	
482	1647-91	0.51/0.30	0.3 NE OF HUME LN NEPL
675	655-29	1.07/0.61	ON HUME ST SEPL EXT
680	649-46	2.13/0.61	16.5 SE OF HUME ST SEPL
1156	NS05-1209	1.60/0.70	3.9M E OF BDY OF LOTS 10-12 & 6-8 CLARKE LN
1157	NS05-1209	1.60/0.70	2.5M E OF BDY OF LOTS 10-12 & 6-8 CLARKE LN
1345	LN09-0209	1.10/0.70	1.3NW OF HUME ST EXTD SBL & 1.1E OF CLARKE ST EXTD WPL
1742	SN15-1024	0.50/0.50	

WARNING

Ausgrid's plans show the position of assets at the time of installation and may not account for subsequent changes to road alignments, fences or buildings. The plans show no more than the presence or absence of Ausgrid assets in the street.
Persons working near electricity networks must exercise care and will be held responsible for any damage caused.
You must excavate by hand or use vacuum excavation to establish the location of Ausgrid underground cables and associated assets.
Underground: Working near a cable may result in electric shock even if no contact is made. Any work in the vicinity of any cable should only be performed using safe work methods developed in accordance with the recommendations included in WorkCover Code of Practice for Excavation and WorkCover Guide for Work Near Underground Assets
as well as recommendations of Ausgrid's Network Standard NS156.
Overhead: Do not excavate near poles or towers until the stability of the foundation has been assessed by Ausgrid. Cables or earth conductors may be present close to substations, poles or towers.
Workers must maintain safe approach distances and follow applicable WorkCover Codes of Practice.
NOTE: 1. You must keep Ausgrid plans on site during excavation works. If the people actually performing the excavation works do not know how to read and interpret Ausgrid's plans, then the work must be directed by a person who knows how to read and interpret the plans. 2. This information includes data from the NSW Digital Cadastral Database by Land and Property Information (c) 2016, used under Creative Commons licence version 4.0.

MO43131	MO43132	MO43141	ISG GRID
MO43133	MO43134	MO43143	
MO43311	MO43312	MO43321	
21Q11	22A11	22B11	GRID

MO43143GMLA0

Distribution - 59404680

INFORMATION ON THIS PLAN ONLY VALID FOR 30 DAYS FROM ISSUE DATE

6 Mar 2017

Page 1 of 1

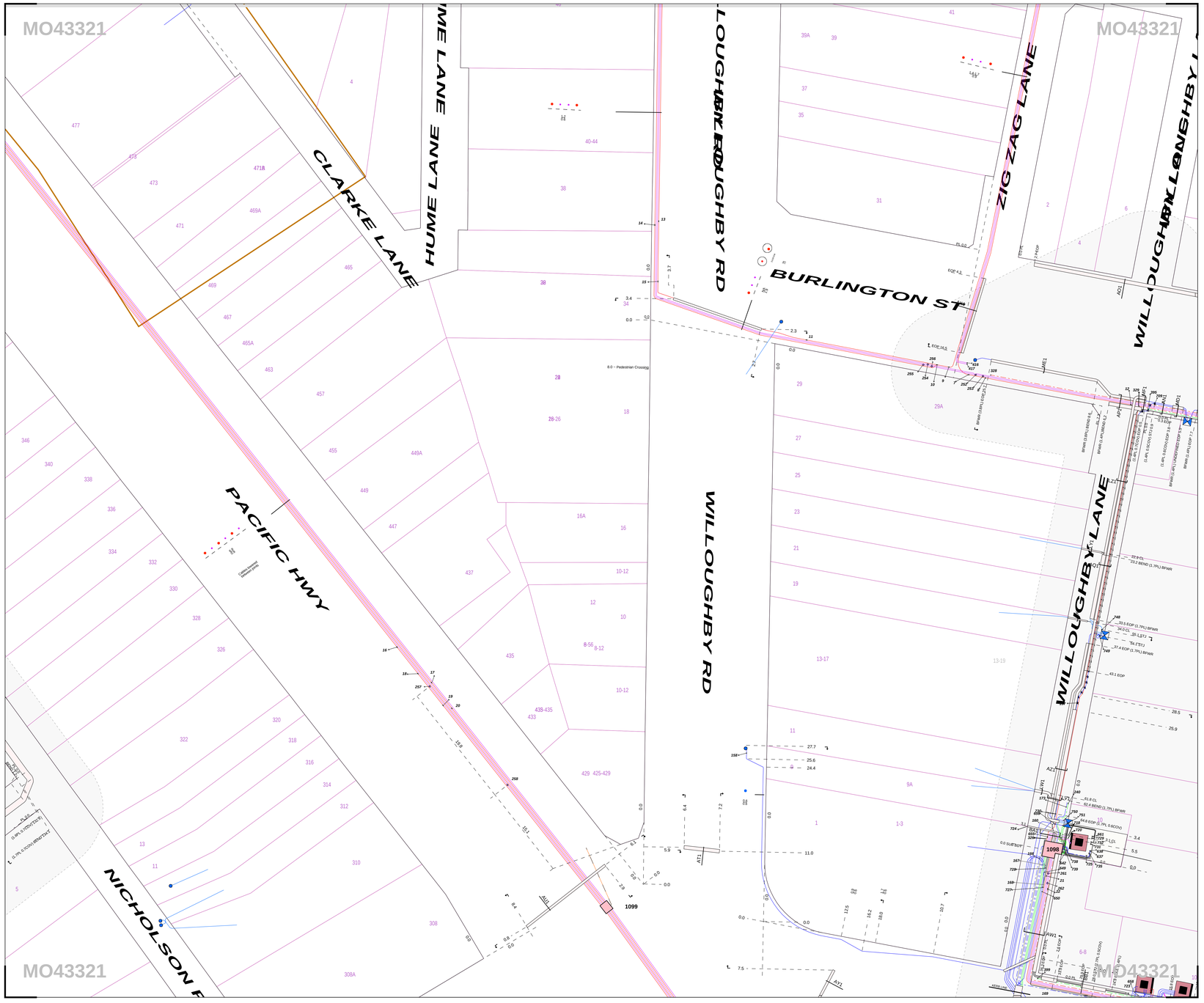
1:251

0 — 15 metres

N

Ausgrid

A0 MOCS_std_plot



WARNING

Ausgrid's DIAGS show the position of assets at the time of installation and may not account for subsequent changes to road alignments, fences or buildings. The plans show no more than the presence or absence of Ausgrid assets in the street.
Persons working near electricity networks must exercise care and will be held responsible for any damage caused.
You must excavate by hand or use vacuum excavation to establish the location of Ausgrid underground cables and associated assets.
Underground. Working near a cable may result in electric shock even if no contact is made. Any work in the vicinity of any cable should only be performed after the cable has been identified in accordance with the recommendations included in WorkCover Code of Practice for Excavation and WorkCover Guide for Work Near Underground Assets,
as well as recommendations of Ausgrid's Network Standard NS156.
Overhead: Do not excavate near poles or towers until the stability of the foundation has been assessed by Ausgrid. Cables or earth conductors may be present close to substations, poles or towers.
Workers must maintain safe approach distances and follow applicable WorkCover Codes of Practice.
NOTE: 1. You must keep Ausgrid plans on site during excavation works. If the people actually performing the excavation works do not know how to read and interpret Ausgrid's plans, then the work must be directed by a person who knows how to read and interpret the plans. 2. This information includes data from the NSW Digital Cadastral Database by Land and Property Information (c) 2016, used under Creative Commons Licence version 4.0.

MO43131	MO43132	MO43141
MO43133	MO43134	MO43143
MO43311	MO43312	MO43321
21Q12	21Q13	21Q14
22B12	22B13	22B14

ISG GRID
GRID

MO43321GMLA0

Distribution - 59404680

INFORMATION ON THIS PLAN ONLY VALID FOR 30 DAYS FROM ISSUE DATE

Page 1 of 1

6 Mar 2017

1:251

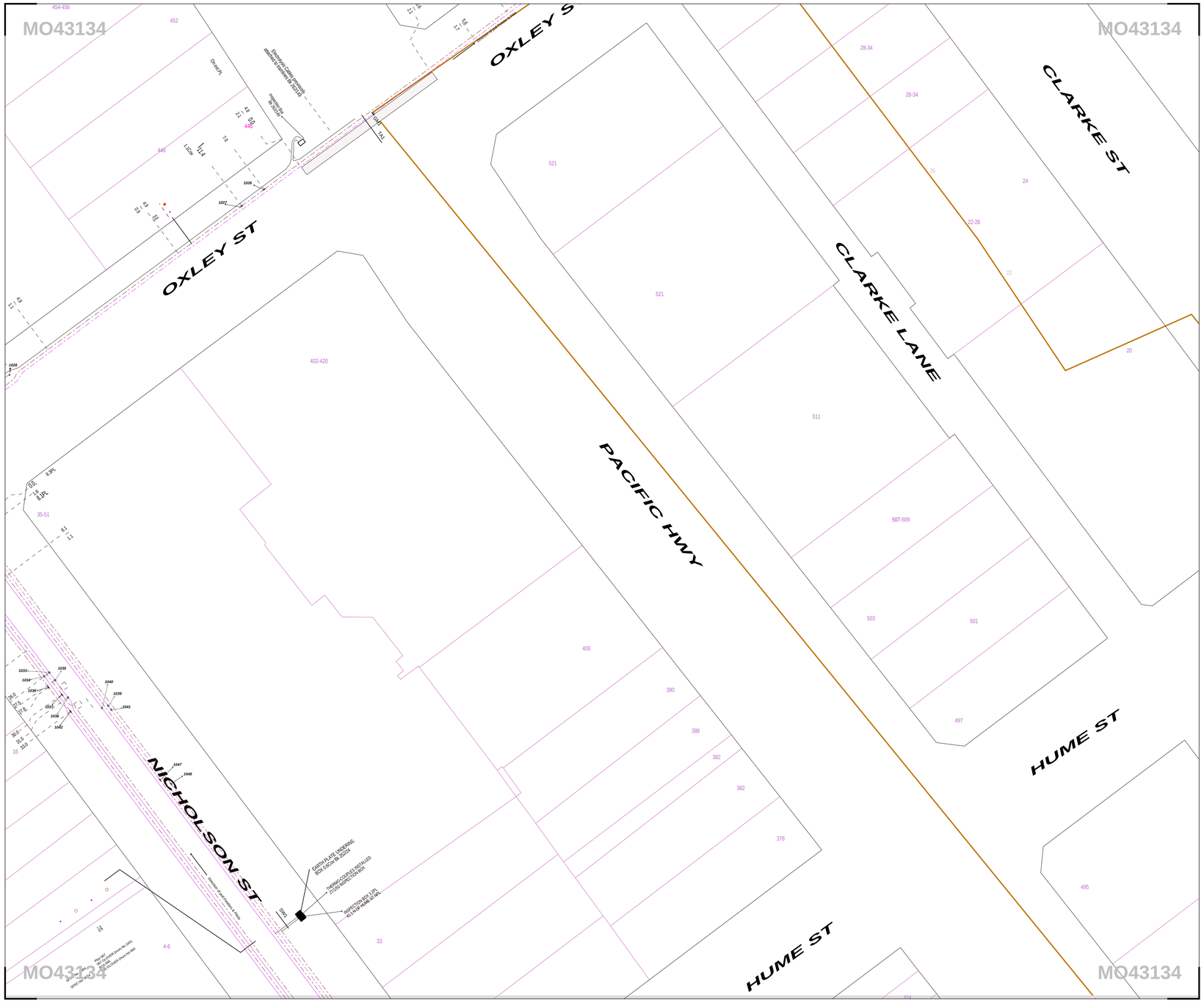
0 15 metres

N

Ausgrid

A0 MOCS_std_plot

You are working near Transmission Cables. You must contact Ausgrid on (02) 4951 9200 at least two weeks before work commences. See Ausgrid Network Standard NS156.



WARNING

Ausgrid's plans show the position of assets at the time of installation and may not account for subsequent changes to road alignments, fences or buildings. The plans show no more than the presence or absence of Ausgrid assets in the street.

Persons working near electricity networks must exercise care and will be held responsible for any damage caused.

You must excavate by hand or use vacuum excavation to establish the location of Ausgrid underground cables and associated assets.

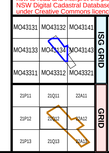
Underground: Working near a cable may result in electric shock even if no contact is made. Any work in the vicinity of any cable should only be performed using safe work methods developed in accordance with the recommendations included in WorkCover Code of Practice for Excavation and WorkCover Guide for Work Near Underground Assets

as well as recommendations of Ausgrid's Network Standard NS156.

Overhead: Do not excavate near poles or towers until the stability of the foundation has been assessed by Ausgrid. Cables or earth conductors may be present close to substations, poles or towers.

Workers must maintain safe approach distances and follow applicable WorkCover Codes of Practice.

NOTE: 1. You must keep Ausgrid plans on site during excavation works. If the person responsible for performing the excavation works do not know how to read and interpret Ausgrid's plans, then the work must be directed by a person who knows how to read and interpret the plans. 2. This information includes data from the NSW Digital Cadastral Database by Land and Property Information (c) 2016, used under Creative Commons licence version 4.0



MO43134GMLA0

Transmission - 59404680

INFORMATION ON THIS PLAN ONLY VALID FOR 30 DAYS FROM ISSUE DATE

6 Mar 2017

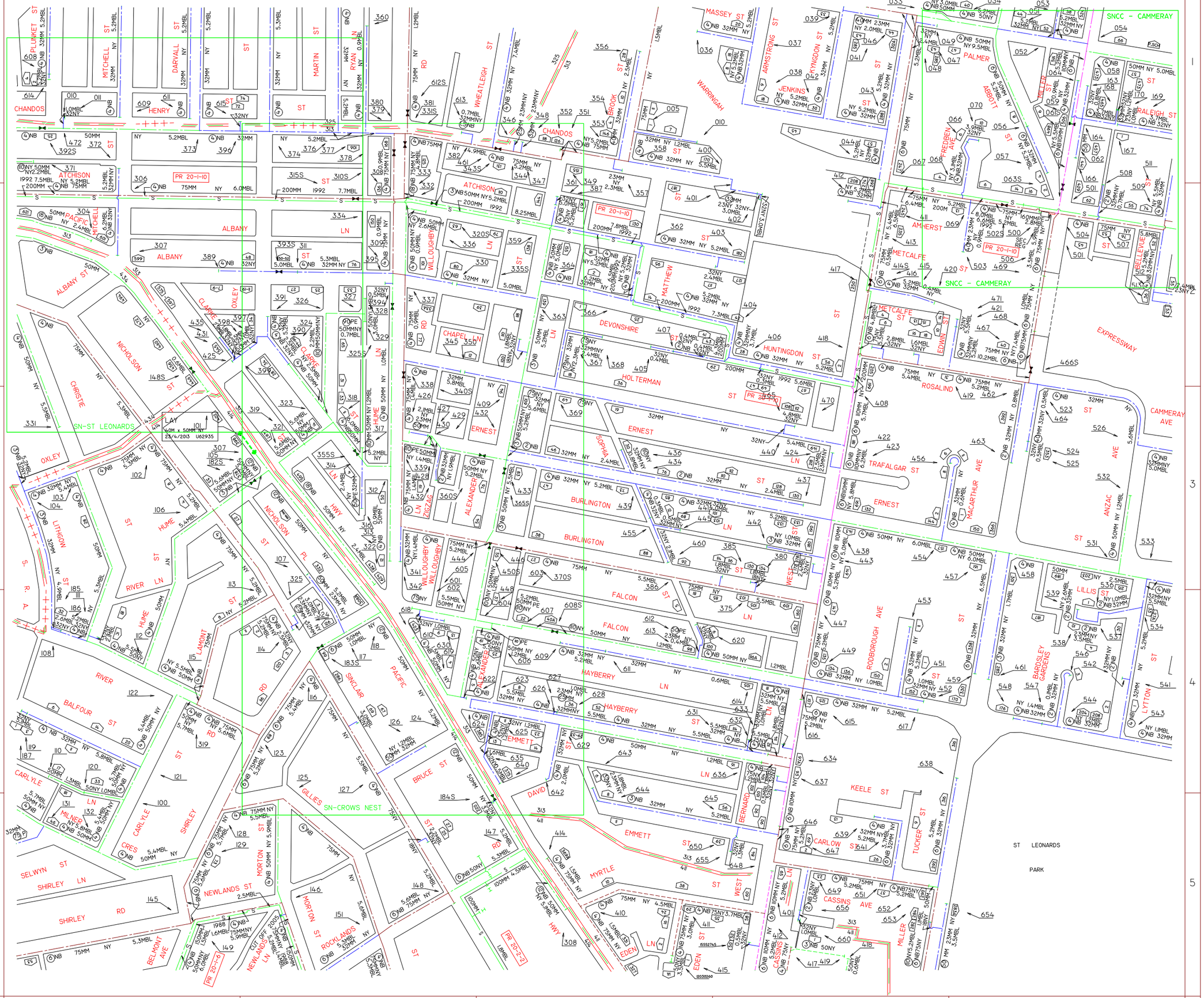
Page 1 of 1

N

1:251

0 — 15 metres

Ausgrid



MOSMAN 4C

SCALE 1:2000

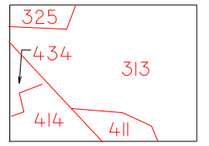
50 0 50 100 150 200

THIS MAP UPDATED ON 10/01/2017
THIS PLAN IS DIAGRAMATIC ONLY. DISTANCES SCALED FROM THIS PLAN MAY NOT BE ACCURATE.

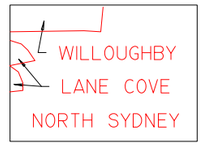
DATE ALTERED:..... BY:.....

G6B	M04A	M04B
G6D	M04C	M04D
G9B	M07A	M07B

ADJOINING MAPS



NETWORK AREA



MUNICIPALITY AREA

Jemena

KEY

MAX ALLOWABLE OPERATING PRESSURE

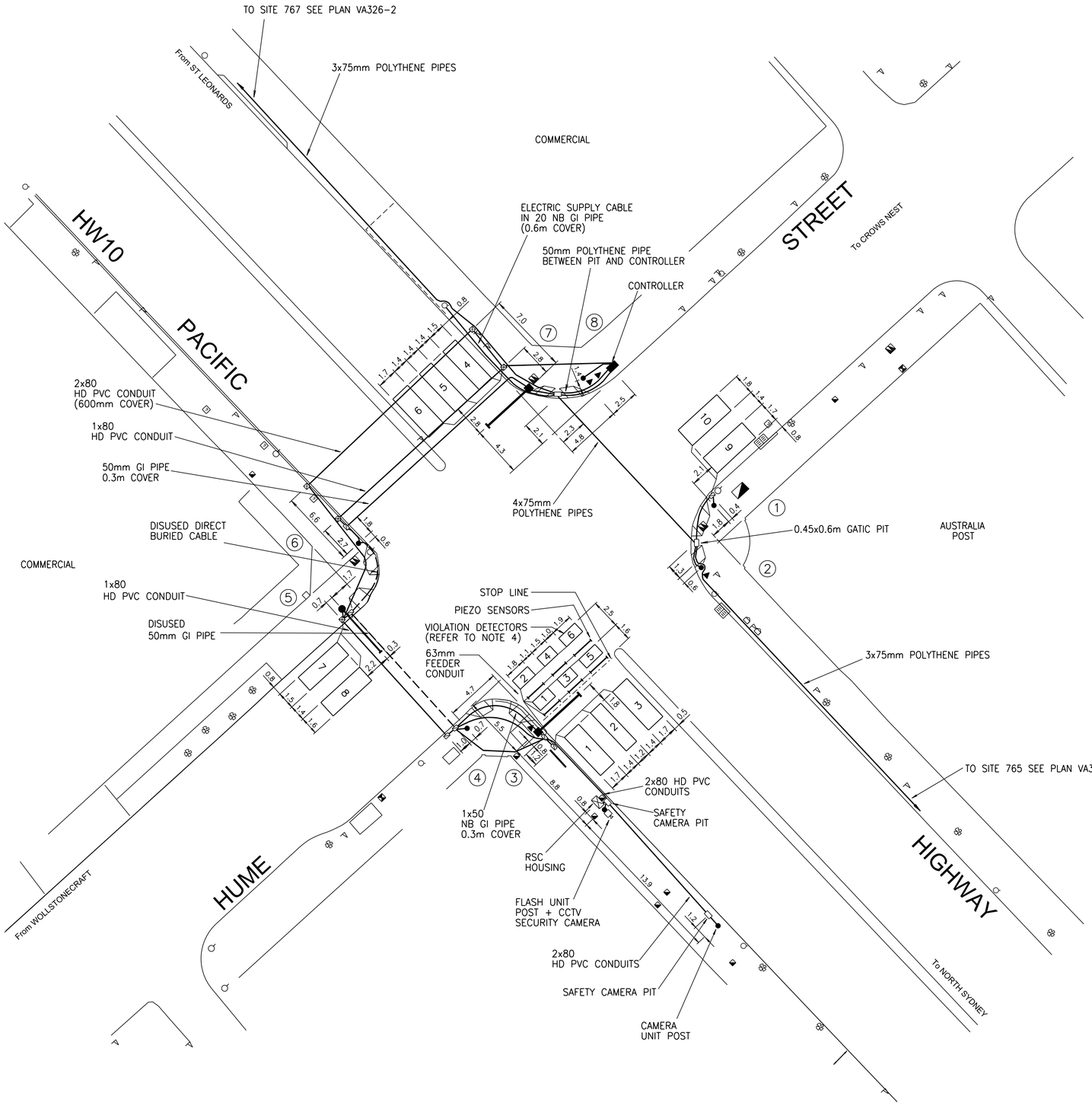
T	TRUNK PIPELINE	7000 kPa
P	PRIMARY MAIN	3500 kPa
S	SECONDARY MAIN	1050 kPa
400	NETWORK MAIN	400 kPa
	NETWORK MAIN	300 kPa
	NETWORK MAIN	210 kPa
100	NETWORK MAIN	100 kPa
30	NETWORK MAIN	30 kPa
	NETWORK MAIN	7 kPa
	NETWORK MAIN	2 kPa
	PROPOSED MAINS	
PR 11-2 3	STEEL MAIN PROJECT NUMBER	
P	PRESSURE MONITORING STATION	
	VALVE	
	SYSTEM PRESSURE REGULATOR	
S	SIPHON	
123	NETWORK NODE	
123S	NETWORK VALVE NODE	
298	VALVE NUMBER	
6NB	6 INCH CAST IRON MAIN	
150MM	150MM STEEL MAIN	
110MM PE/NY	110MM POLYETHYLENE/NYLON MAIN	
6NB 50MM NY	50MM NYLON INSERTED INTO 6NB MAIN CAST IRON MAIN	
1.2MBL	DISTANCE IN METRES OF MAIN FROM BOUNDARY LINE	
1957	YEAR LAID	
	MUNICIPALITY BOUNDARY	
	NETWORK BOUNDARY	
123	HOUSE NUMBER	

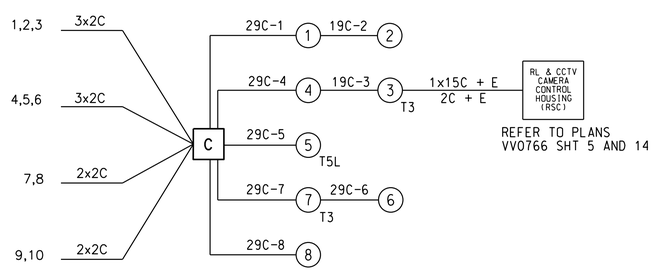
MOSMAN 4C

0010.329.VV.0766

DATE IN SERVICE: 25/06/1973

Transport Roads & Maritime Services





REFER TO PLANS VV0766 SHT 5 AND 14

SIGNAL CABLE LAYOUT

NOTES

1. CABLE COVER : IN ROADWAY 0.6m ABOVE GI OR PVC PIPE IN FOOTWAYS & MEDIAN ISLANDS 0.45m ABOVE 'ELECTRIC BRICKS' UNLESS OTHERWISE STATED.
2. ALL CABLES IN FOOTWAYS ARE INSTALLED IN 1x80mm PVC OR POLYTHENE PIPE UNLESS OTHERWISE STATED.
3. FOR FURTHER DETAILS OF RED LIGHT, CCTV SECURITY CAMERA & TIRTL INSTALLATIONS, REFER TO SHEETS 15, 13 AND 14.
4. VIOLATION DETECTORS FOR SAFETY CAMERA ARE INSTALLED 0.2m IN FRONT OF THE STOPLINE. THE VIOLATION LOOPS ARE 1.0m WIDE & SPACED 1.5m APART. OTHER DIMENSIONS & SPACING ARE SHOWN ON THE PLAN ABOVE.
5. ALL PITS SHOWN THUS ⊠ ARE 400mm x 300mm GATIC PITS.

A	ORIGINAL ISSUE	
B	REDRAW PLAN TO W.A.E. RED LIGHT CAMERA, FLASH AND ASSOCIATED DETECTORS ADDED. LAWSON/MEYER 6/95	
B	ISSUE JI NO SS18 REMOVE L.T.O.R. AND RENAME DETS. R.M.A. C.L.Z. 24/11/98	
C	ISSUE JI/ SS643 NEW POSTS 4 AND 8. CABLE RUN ALTERED. NEW ROADCROSSING ON HUME AND PACIFIC ROADS. NEW DETS 1,2,4,5 AND 6. REC REPLACED BY SAFETY CAMERA. DB 27-04-2012	
D	ISSUE: WAE DETS DISCONNECTED ON PACIFIC HIGHWAY. DETS RENAMED. CABLE LAYOUT ALTERED. A.L 25/09/2013 M.M	
E	ISSUE: JI-SS752 POST 1 & 5 ARE NEW. RECUT DET'S 7,8,9 & 10. DET'S 2,3,4,5 & 6 ADDED. DET'S RENAMED. CABLE RUN ALTERED. NOTE 5 ADDED. A.L 08/09/2015 M.M	
F	ISSUE: JI-SS752 WORKS AS EXECUTED A.L. T.S 10/01/2017	

PUBLIC UTILITY LEGEND		REFERENCE PLANS	
HYDRANT	□	SYMBOLS/ABBS.	VD003-6
STOP VALVE	▲	STD POSIT	VD001-5
GAS VALVE	#	DET SCHED EXP	VD018-10
SEWER MANHOLE	⊛	PRES. DETECT	VC005-17
TELECOM PIT	◪	SSG DIS. SEQ.	VD018-8
ELECT LIGHT POLE	↺	DESIGN LAYOUT	SHEET 15
POWER POLE	○	CABLE CHART	SHEET 13
STAY POLE	⊘	RLSC CHART	SHEET 14
TELEPHONE BOX	T	SURVEYOR :	
TELECOM PILLAR	◕	DATE :	

U.B.D. Ref.
I.S.G. E:
CO-ORDS N:

DESIGNED LAWSON/MEYER

CHECKED C.AYO 05/95

SITE CHECKED

RECOMMENDED

APPROVED

R.C. BIRD
ELECTRICAL DESIGN MANAGER
JUL'95
DATE

ROADS AND MARITIME SERVICES

MUNICIPALITY OF NORTH SYDNEY
PACIFIC HIGHWAY &
HUME STREET
CROWS NEST

CABLE INSTALLATION TCS No 766

EXISTING ☒ PROPOSED ☐

CADD FILE: VV0766_12F_INS.dgn

SCALE 5 0 (1:200) 5 10

ISSUE F

FILE 329.TS.177 SUPERSEDES SHEET/ISSUE 2B

REGN. 0010.329.VV.0766

SHEET 12