# North Eveleigh
# Electrical and Telecommunications Services Concept Report

**Commercial-in-Confidence**

Redfern Waterloo Authority

4th April 2008
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**North Eveleigh Electrical and Telecommunications Services Concept Report**

Prepared for

**Redfern Waterloo Authority**

Prepared by

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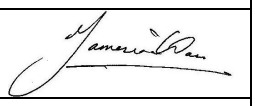
| C | 4/4/2008 | Final Report | Jamie Wan, Associate Director |  |
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# Executive Summary

Bassett Consulting Engineers have been engaged by the Redfern-Waterloo Authority to undertake various technical sub-studies in relation to the Concept Plan of North Eveleigh.

The main objectives of the report are to:

- Gain an understanding of the existing infrastructure provision and its capacity to serve the development in respect of power supply and telecommunications;
- address the requirements of the development for the provision of utilities including staging of infrastructure works.
- Ensure that the servicing strategy reflect the land capability and considers site constraints.

Our major findings are summarised below:

## 1.1 Electricity

**Existing Infrastructure Capacity**

The site is currently serviced by an Energy Australia on-site substation ( S7680) which has spare capacity in the order of 700kVA.

Energy Australia have advised that the existing network has insufficient capacity to cater for significant load growth beyond this.

**Constraints, Opportunities and Issues**

Utilising traditional After Diversity Maximum Demand (ADMD) load estimation method based on historical data the forecast electrical load would be approximately 10MVA.

The Director General Requirements for the proposed Concept Plan are required to consider Ecologically Sustainable Development principles. Energy Modelling by the Institute for Sustainable Futures has estimated a mandatory energy consumption target (Base case 5MVA) which is significantly lower than load estimates derived from the traditional ADMD method.
Energy Australia has advised that is necessary to augment the 11kV network and provide two new 11kV feeders from the Zone Substation, to service the site.

**Summary**

We have considered the following options for servicing the development site.

Option 1 uses existing spare capacity in the on-site substation to facilitate isolated early development of a small portion of buildings and to delay costs associated with an 11kV network upgrade.

On-site reticulation from a new Site Main Switchboard to each building would require the installation of large 415V copper conductors in new cable containment within the site.

The developer would then need to wait for Energy Australia to augment the network as other loads became available for other users or other developers on the site.

Option 2 involves the augmentation of the Energy Australia Network to provide 2 new High Voltage feeder cables to service the site's load in the Baseline Energy Efficiency Scenario. The developer would fund the majority of the connection work back to the Zone Substation.

Option 3 ISF has estimated peak load for the No Net Impact Option at approximately 3.5MVA. This option may suit the implementation of Trigeneration Central Energy Plants for a building or group of buildings. Depending on to what extent the Electricity Grid was required for backup / redundancy augmentation of the Energy Australia 11kV network would still be required.

A combination of Option 1 and Option 3 would enable a staged delivery of power to sectors marked for early release, whilst targeting future sustainable energy management targets.

In all cases the developer is required to make a detail application to Energy Australia setting out development timetable to initiate formal planning.

## 1.2 Telecommunications

**Existing Infrastructure Capacity**

The existing Carriage Works at Eveleigh, 50 pair copper lead in cable is currently being upgraded to fibre in anticipation of the future Site-wide requirements.

There is existing 3G mobile Network coverage at the site.

**Constraints, Opportunities and Issues**

The site will require 5000 pairs of basic telephony, which will be provided via fibre optic technology .

Standard deployment is provided by Telstra at no cost to the developer with the exclusion of the developer being responsible for the cost of providing a trench (which could be shared with other services in order to be more economical) and land on the verge for a remote above ground housing (a green box on the side of the road). The shared trench would be within the standard footpath allocation and will follow the subdivision road layout.

Other opportunities available to the developer include Telstra High Velocity Fibre to the Home which combines telephone services with guaranteed internet speeds up 100Mbps, digital free to air and pay TV and other Internet Products as they become available.
Several other service provides also have infrastructure in the area, which would be available to future developments or specific tenants.

**Summary**

Telecommunication services can be provided to the proposed North Eveleigh development by extending the existing trunk services.

A services search has confirmed there are a number of alternate service providers with whom developers can enter into a commercial agreement to have data services (fibre optic) to the site. This would be on a commercial basis and will need to be negotiated.
These include: Optus, Uecomm, Pipe Networks, PowerTel and VisionStream.

# 2.0 Introduction

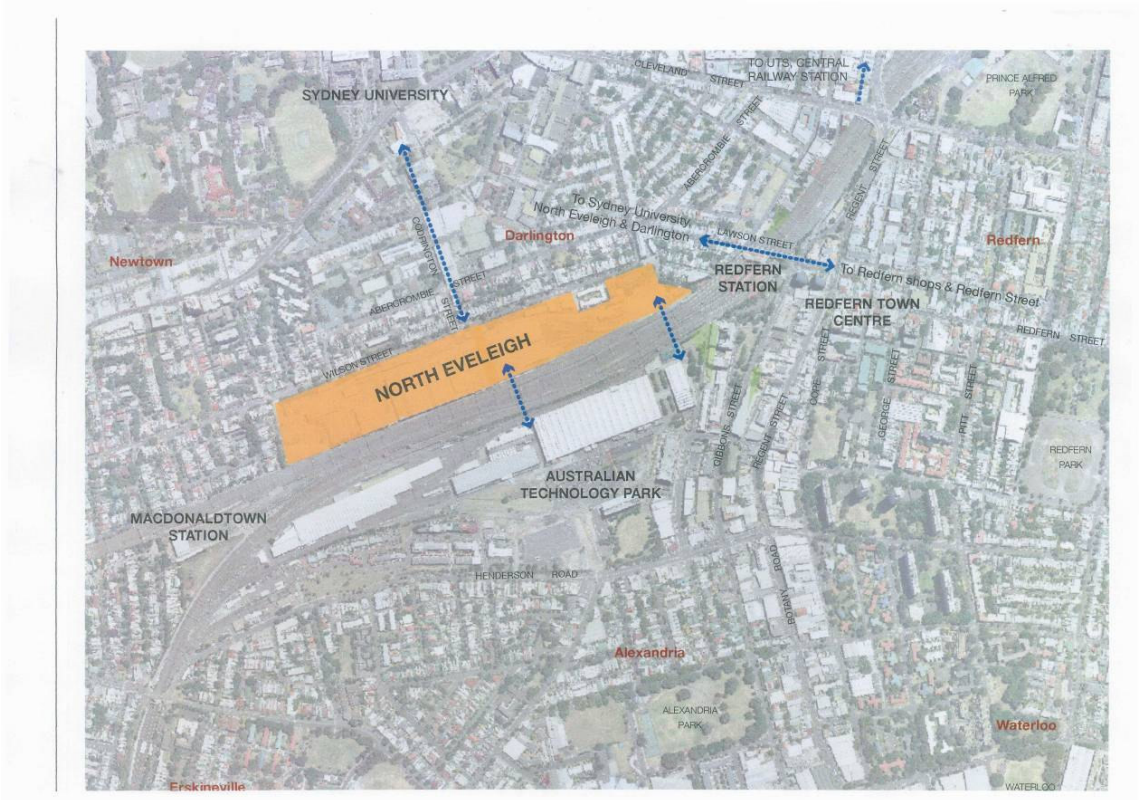
## 2.1 Scope

Bassett Consulting Engineers have been engaged by the Redfern-Waterloo Authority to undertake technical sub-studies in supporting the redevelopment of the North Eveleigh Precinct for future mixed use employment use.

A Concept Plan for the study area has been developed by Bates Smart Architects to describe the vision and the framework of the study area. It establishes the development principles that will be used to progress and guide the realisation of the vision of the proposed development

The current RailCorp Railyards site is located in Darlington, west of Redfern station, within the Redfern-Waterloo Operational Area.

A map of the area is shown below:




## 2.2 Existing RailCorp Infrastructure

This report assumes that the existing RailCorp electricity infrastructure is decommissioned prior to the sale of the land. This consists of 11kV underground and overhead cable, 11kV/415V step down transformers, and 415V underground and overhead cable.

It is noted that there is a RailCorp Argus Telecommunications hut on the site (at the eastern extremity). It is assumed that the provision of low voltage power supplies to the existing Argus communications hut will be undertaken independently of the site infrastructure works.

## 2.3 CarriageWorks at Eveleigh Redevelopment Project

Arts NSW have recently undertaken a refurbishment of the heritage "CarriageWorks" building, to transform this into a Performing Arts Facility (eastern end). A base building refurbishment of the western end enables this space to be fully fitted out by future tenants.

As part of the CarriageWorks Redevelopment the following infrastructure has been established:

- 11kV feeder from Wilson Street, encased in Heavy Duty PVC conduits, under existing driveway/service road. An easement has been established over the conduits within the site
- 2x1500kVA Chamber Substation ( S7860)
- 6 off 100mm Telstra conduits within the same shared services trench. An easement has been established over the conduits within the site. Telstra manholes are located at approximately 100metre intervals over the conduit route, for cable access.
- Telstra had provided standard services to the CarriageWorks Building via a 50 pair copper lead in cable to meet the connection date of January 2007. CarriageWorks is serviced from the Newtown Exchange.

Refer Existing Services Drawings E100 / E101 in the Appendix.

# 3.0 Electricity Servicing

## 3.1 Design Input and Assumptions

### 3.1.1 Electrical Demand

The electrical load requirement for the site has been estimated using the following methodologies:

- Traditional After Diversity Maximum Demand (ADMD) using industry accepted typical VA/sqm figures which vary for each different building type
- Embedded energy model of the site. Modelling undertaken by the Institute of Sustainable Futures to incorporate the effects of mandated planning tools

Energy Australia are aware of the Environmental Planning Requirements for this State Significant Development and have indicated in meetings ( ref: Appendix – Summary of meetings with Energy Australia ) that the figures presented in the model will be reviewed and compared against Energy Australia's figures which are based on historic data analysis only and do not take into account the effect of rating schemes such as BASIX, NatHERS, AGBR,

### 3.1.2 Land Release Rate

At the time of publication it is unknown if the entire site will be sold as one entity, or as multiple staged releases of land.

It is anticipated that the western end of the site consisting of residential buildings only, may be more attractive to developers and hence be released as a first priority prior to the eastern end.
There are advantages to this methodology -

a) Telstra Telecommunications infrastructure is in place
b) Sufficient ducting within the site is in place to reticulate 11kV / 415V electricity cables
c) There is available spare capacity within the existing Substation S7680 Wilson Codrington to provide an unmetered low voltage supply to a combination of Blocks A, B and C. See separate section below

### 3.1.3 Asset Relocation

The Energy Australia and Telstra easements over the existing infrastructure installed in 2006 for the CarriageWorks Redevelopment, are located over the existing service road. At the time of the installation a Concept Plan for the site was not developed hence the easements could not be located with respect to any future planned roads. There were also restrictions in terms of existing RailCorp assets (buildings and infrastructure). Minor relocation of these assets will be required as part of the Site Redevelopment. Refer Proposed Infrastructure Drawing E201 in the Appendix.

## 3.2 Existing Services Infrastructure

### 3.2.1 Zone /Transmission Substations

There are several zone substations, surrounding the Redfern area, being Zetland, St Peters, Surry Hills (Campbell St ), Green Square which present likely sources of power. Energy Australia are undertaking a detailed HV connection investigation for this project and although the HV connection information will take several more weeks to finalise, EA have provided preliminary advice that there is insufficient capacity in the existing 11kV network to support the Site (Base Case Demand of 5MVA in addition to the existing demand drawn from Substation S7860 supplying the CarriageWorks Building.)

Energy Australia have also stated in their preliminary advice that the St Peters Zone Substation will be the source of a new 11kV supply consisting of two new underground feeders to be reticulated from the Zone Substation, to the Site.

We note that this information is not guaranteed until the formal HV connection information is presented. Energy Australia's formal response to the HV Application for Connection Information is anticipated within 2-3 months from the application date, and may be valid for a nominal period of 12 months.

The nearest Energy Australia Transmission Substation (33kV/11kV) is located at Beaconsfield. Energy Australia's preliminary advice mitigates the need for Transmission Reticulation to an on-site zone substation.

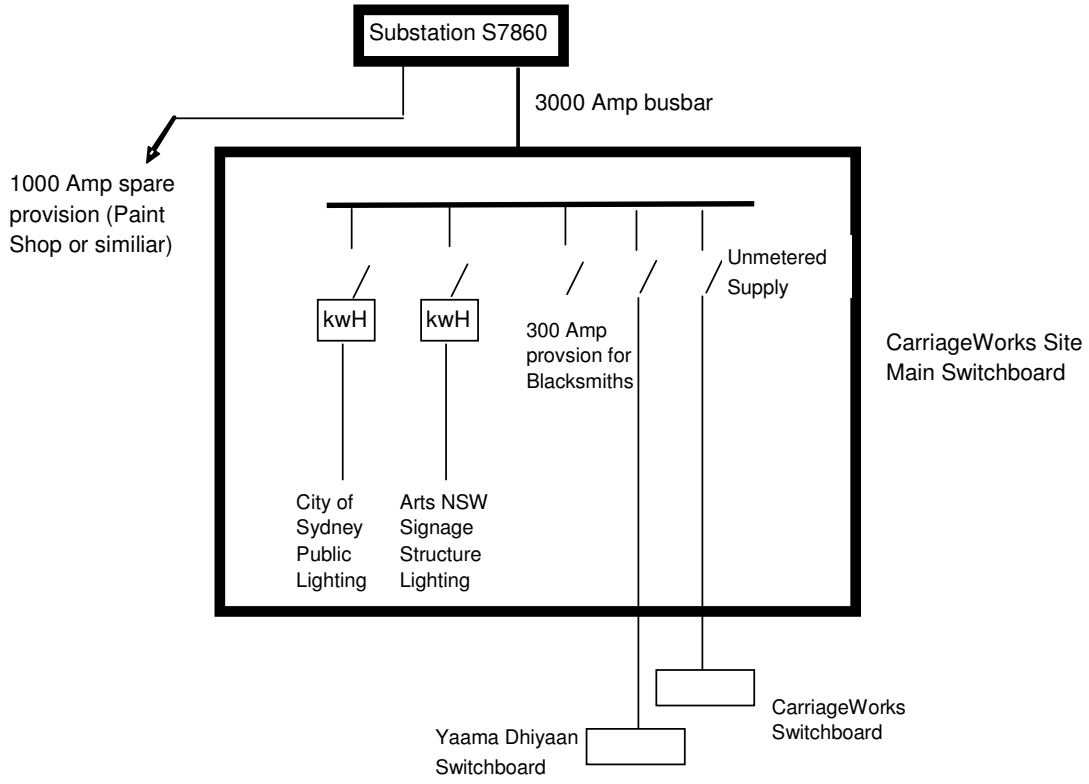
Energy Australia have no current plans to upgrade their infrastructure in the area. As the development will be classed as a large load customer the developer will need to fund all network augmentation work to the site boundary.

Energy Australia are unable to make formal comment on the impact of other proposed developments in the area however consideration of these is incumbent in their planning investigations and advice.

### 3.2.2 North Eveleigh Precinct Distribution Network

As discussed in Section 2.3 there is an existing on site chamber substation S7860 Wilson Codrington which consists of 2 off 1500kVA transformers. The firm rating of this substation is 2902 Amps (refer Energy Australia email dated 28/2/08 in the Appendix). This currently supplies the CarriageWorks Building, Yaama Dhiyaan (ex-Canteen building) and the CarriageWorks Public Entry facility located within the Blacksmiths' Workshop. There are provisions to supply the future refurbished Blacksmiths' Workshop, from the Site Main Switchboard.

The configuration of the existing Main Switchboard is shown below.




Energy Australia has provided historic demand readings to determine the load on the substation. A Maximum Average load of 400Amps was recorded during June – July 2007.
Another more recent logging exercise has indicated that the Maximum Average load is 915 Amps ( A Phase) This peak was recorded at 9pm on Friday 7/3/08 which captures the load drawn by a major performance / live Television studio filming

The existing Substation on the site is supplied from St Peter's zone substation via an 11kV feeder that runs west –east within Wilson Street.

As part of the CarriageWorks upgrade ducts have been installed within Wilson Street and throughout the Site. Refer the Existing Services Drawings in the Appendix.

A detailed description of the existing RailCorp assets on site is not within the scope of the Concept Report. The Concept Report assumes a Greenfield site i.e It is assumed that removal of RailCorp's decommissioned infrastructure would be not the responsibility of a future developer. Therefore the existing services drawings provided in the Appendix of this report relate to non-RailCorp infrastructure.

## 3.3 Estimated Electrical Load Demands

### 3.3.1 CarriageWorks Substation

The following table summarises the Design Maximum Demand allowances for Building S (CarriageWorks Building) and Building R (Blacksmiths' Workshop).. At the time of planning for the CarriageWorks project it was envisaged future use of this space may include air conditioned commercial offices, and present thinking projects a mixed use building in the future. It is noted that a minor refurbishment of the Blacksmiths Workshop is currently being undertaken to utilise this building for markets, car parking and arts uses in the short term.

| | EXISTING CARRIAGEWORKS SUBSTATION - | | | | | |
|---|---|---|---|---|---|---|
| | **Area Usage** | **Length** | **Width** | **Area(sq.m.)** | **VA/sq.m rate** | **Subtotal VA** |
| **1** | **Carriageworks - Design Maximum Demand** | | | | | |
| | | | | | **kVA** | **2,097** |
| | | | | | **TotalAmps** | **2,913** |
| **2** | **Blacksmiths ( Refurbishment not completed)** | | | | | |
| | **Area Usage** | **Length** | **Width** | **Area(sq.m.)** | **VA/sq.m rate** | **Subtotal VA** |
| | **Ground Level** | | | | | |
| | Market/Carpark | | | 2400 | 20 | 48000 |
| | Upper Level - Commercial | | | 2400 | 80 | 192000 |
| | | | | | **Total kVA** | **240** |
| | | | | | **TotalAmps** | **333** |
| **3** | **Paint shop or other - provision for 1000Amp supply** | | | | **Total kVA** | **720** |
| | **(currently spare capacity with LV distribution feeders to Wilson Street Network)** | | | | | |
| | **SUBSTATION CAPACITY** | | | | **Total kVA** | **3,057** |

Bassett Consulting Engineers have carried out a Diversified Maximum Demand assessment using industry accepted typical VA/sqm values as follows:

- 85VA/sqm for Air Conditioned High Rise Commercial (AS/NZS3000:2007 Table C3)
- 100VA/sqm for Air conditioned Retail (AS/NZS 3000:2007 Table C3)
- 100VA/sqm for Theatre & similar uses (AS/NZS 3000:2007Table C3)
- 5kVA per apartment with gas ( based on past projects)

These figures correlate with Energy Australia's load density values as published in their Network Standards ( NS 0112 )

This is compared against the Baseline Energy Efficiency Scenario Site Wide Demand as estimated by the Institute for Sustainable Futures (ISF) as part of the Energy Management Plan, for each building, in the table below.

It is noted that the ISF model forecasts the peak demand of each group of buildings by type - residential, commercial, retail and cultural. Each individual building load therefore is a pro rata measure of the total for that building type, dependent on the floor area . This assumes that the majority of the residential load is grouped together and the majority of the commercial load is grouped together.

| North Eveleigh Rail Yards Preliminary Maximum Demand Assessment | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| North Eveleigh Rail Yards Masterplan Area Schedule | | | | | | | | |
| OVERALL LOAD SCHEDULE | | | | | | | | |
| Block | GFA Mix | | | | | | | |
| | Residential | | Office | | Retail | | Cultural | |
| | ADMD Demand (kVA) | Base Case Demand (kVA) | ADMD Demand (kVA) | Base Case Demand (kVA) | ADMD Demand (kVA) | Base Case Demand (kVA) | ADMD Demand (kVA) | Base Case Demand (kVA) |
| | | | | | | | | |
| Block A | 284.48 | 231.06 | | | | | | |
| Block B | 209.68 | 170.31 | | | | | | |
| Block C | 784.12 | 636.88 | | | | | | |
| Block D | 955.76 | 776.29 | | | | | | |
| Block E | 287.52 | 233.53 | | | | | | |
| Block F | 113.68 | 92.33 | | | | | | |
| Block G | 262.64 | 213.32 | | | | | | |
| Block H | 288 | 233.92 | | | 659.5 | 547.50 | | |
| Block K | | | 1298.12 | 603.84 | 47.3 | 39.27 | | |
| Block L | | | 1009.97 | 469.80 | 36.7 | 30.47 | | |
| Block M | | | 956.165 | 444.78 | 34.8 | 28.89 | | |
| Block N | 53.76 | 43.67 | | | | | 87.2 | 24.50 |
| Block P | 453.88 | 368.65 | | | | 40.43 | | |
| Block Q | | | | | | | 33.6 | 9.44 |
| | 3693.52 | 2999.97 | 3709.485 | 1725.53 | 794.5 | 700.00 | 120.8 | 33.94 |
| Masterplan total | | | | | | | | |
| Existing Carriageworks Substation 2x1500kVA Installed 2006 | | | | | | | | |

## 3.4 Energy Australia Planning Advice

Two formal meetings have been held with Energy Australia Customer Service, to initiate the planning for this project, and to obtain HV Design information for the purposes of this report.
A summary of these meetings can be found in the Appendix.

A formal application for High Voltage Planning was required due to the size of the estimated load, and network planning complexities particularly in light of several major developments proposed in the area that will have a significant effect on planning advice. The Project number that may be used for future reference to the project, is XCZ014769.

This formal application will enable engagement of Energy Australia's HV Planning Division in detailed investigations, and determination of Design Information. A Level 3 Accredited Service Provider can then be engaged for the HV reticulation design which will enable and to determine accurate Construction costs to be determined.

EA have provided preliminary advice, dated 19/3/08, that there is insufficient capacity in the existing 11kV network to support the Site (Base Case Demand of 5MVA in addition to the existing demand drawn from Substation S7860 supplying the CarriageWorks Building.)

Energy Australia have also stated in their preliminary advice that the St Peters Zone Substation on Sydney Park Road will be the source of a new 11kV supply consisting of two new underground feeders to be reticulated from the Zone Substation, to the Site.

The development will be classed as a "large load customer" and therefore Energy Australia will require full capital contribution for the cost of all connection works back to the zone substation.

## 3.5 Site Requirements

The current easement is within the existing Service Road and runs parallel to the western boundary and then turns to run parallel to Wilson Street. The Road is reworked in the Concept Plan, therefore the easement will need to be re-aligned with the new roadway and existing Energy Australia assets relocated accordingly. Drawing E201 in the Appendix details the extent of the relocations required.

### 3.5.1 Baseline Energy Efficiency Scenario

We have considered the following options for servicing the site. Refer to Concept Design Drawings which are appended to this report.

**Option 1 – Opportunistically Utilise Spare Capacity**
Option 1 is to utilise the existing capacity of 720kVA (1043 Amps) , available in the Codrington-Wilson Substation S7860 on site, to service residential building groups which can be developed as the first stage of the development. The next step would be to wait until Energy Australia is forced to upgrade their substations due to organic growth. This would be funded by Energy Australia or other developer(s).

Due to restrictions the length of consumers mains to maintain arc fault protection and maximum volt drop (Energy Australia's Network Standards requirements) A new Site Main Switchboard will need to be established within the Spare Main Switchroom adjacent to the Carriageworks Main Switchroom.

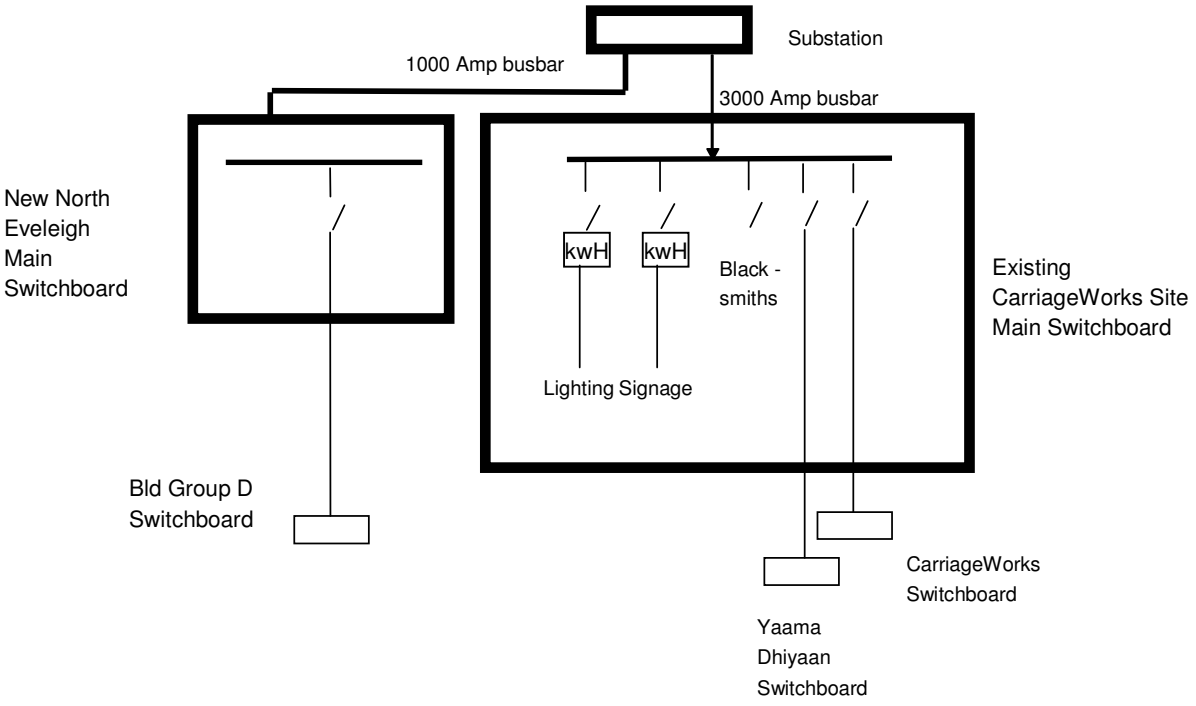
There are some existing ducts emanating from the Spare Main Switchroom that terminate at a pit outside of the Substation / Entry Structure.
The unmetered supply reticulation will be at 415V therefore buildings in closer proximity to the Substation, with suitable loads, have been targeted to provide a least cost installation
- Building Group D (776kVA)
- Building Group E & G ( 447kVA)

Reticulation to Buildings A/C or B/C from the Main Switchboard at low voltage would not be feasible due to the physical size of cable required to meet voltage drop and earth fault loop impedance requirements.

There are existing Energy Australia HV ducts ( 5 off 125 spare) beneath the roadway however these are not available for private low voltage reticulation.

It is also noted that the Main Switchboard presents a single point of failure therefore multiple buildings may be affected if there is a major fault at the Main Switchboard or it is taken out of service – a disadvantage of this scheme.

.
The proposed reticulation schematic is shown below:




Alternatively the developer could apply to Energy Australia to obtain street feeds ( 415V supply directly from Wilson Street ) however, currently the street capacity is very limited therefore the application would require Energy Australia to consider augmentation of the network, using the spare capacity in Substation S7680.

Option 1 seeks to minimise capital contributions to Energy Australia but at the opportunity cost of not being in a position to release land at a high rate. This option may be inconsistent with the desire to accelerate development.

**Option 2 – Provide new High Voltage feeds to Site**

This option could involve utilizing available spare capacity from the existing Substation S7860 as per option 1 until capacity is exhausted. The next step would be to assist Energy Australia with the upgrade of their 11kV network to the site, in conjunction with establishment of 11kV/415V substations to serve a particular selection of building/s.

Energy Australia has been engaged to provide High Voltage Connection Information, which will incorporate a detailed investigation of the requirements for the site and the capacity of the network. Preliminary advice is that the St Peters Zone Substation will be the source of a new 11kV supply consisting of two new 400Amp feeder cables to be reticulated from the Zone Substation, to the Site.

As the development is considered large load customer ( aggregate of load requested from Energy Australia is greater than 200 Amps /11kV within two years and is more than 50% of the nameplate rating of any existing EA asset that is required to be augmented) the customer may be required to

fund part or all of the network augmentation. Energy Australia have stated in their preliminary advice that the developer will be required to fund all the connection costs back to the zone.

Based on the preliminary feeder route provided by Energy Australia ( see Appendix) the cost of the construction work is broadly estimated at $5,400,000, consisting of the following components:

The future developer of the site shall assess the options available in relation to providing this infrastructure to the site versus onsite generation utilising Renewable or Cogeneration technologies.

Once Energy Australia issue a High Voltage design information package including likely HV connection points, a Level 3 Accredited Service Provider can then be engaged for the HV reticulation design.

The site may be then serviced by either kiosk (single transformer) or chamber ( multiple transformer) substations. The kiosk configurations allowable by Energy Australia are 400kVA, 600kVA, 800kVA. Energy Australia has indicated in recent discussions that future regulations may require customers to fund 1000kVA kiosks. 1500kVA kiosks are allowed for a restricted number of scenarios only and must service a dedicated customer.

Refer Drawings E200, E201 and E300 in the Appendix.

### 3.5.2 Option 3

Institute for Sustainable Futures ( ISF) has identified energy and greenhouse targets for the No Net Impact Option, and the strategies by which this level of energy management could be achieved. Cogeneration, or the simultaneous production of electricity and useful heat, capitalises on a number of strategies which administer the Sustainable Case Principles.

The ISF Energy Management Plan discusses the use of trigeneration in detail and based on preliminary energy modelling results which show a 52% reduction in greenhouse gas emissions from the baseline energy efficiency scenario[1], recommends this option be considered depending on commercial viability.

The facility would comprise three reciprocating gas engines, sized to supply all of the site's thermal demands. As the thermal and electrical loads are fairly well correlated the plant can be sized efficiently.

Due to the absence of detailed load information and variability in where the plant might be established, a Cogeneration design is outside the scope of this report, however the following design principles can be established:

- The prime mover shall be sized to meet the peak demand for the site ( 3.5MW for the No Net Impact Option)
- Redundant engines that share the continuous load are desirable for efficiency in operating costs
- Based on the energy modelling results the plant would reasonably consist of 2 off 1.5kW Maximum Output engines + a third smaller engine to make up the balance of the peak load.
- The spatial requirements for such plant would be 600m2 footprint, approximately
- Location of the plant is dependent on noise and atmospheric emissions assessment, as well as a consideration of the relative value of space ( such as in the case of an external Central Energy Plant) versus cost ( Energy Plant located in a high rise building requires consideration of exhaust reticulation and excavation so as not to impact on the NLA of the building)
- Exporting to the Grid : Typically if the site load is less that 80% of the set point of the generation plant- then the excess available generator capacity may be exported back to the grid.
- Energy Australia have stated that a Cogeneration system is acceptable in-principle, and have confirmed that the North Eveleigh site lies outside the CBD Triplex Network. However the

[1] North Eveleigh Energy Management Plan, Institute for Sustainable Futures, p40

developer must formally make application to Energy Australia, specifically with regards to continuous parallel operation with the EA Grid, and any Export requirements

- The design of the customer substation and generation plant shall meet the requirements of AS3000, and the following embedded network standards.

    - Generator Connection Agreement: General Conditions, Version 1, October 2005
    - Energy Australia Network Standard NS195

    Refer to Drawing E400 and E401 for a typical example of a 2 MW Trigeneration Installation.

Energy Australia have also raised potential issues in regards to private onsite generation. The issue of reliability is an important factor to consider, and how customer's expectations with regards to reliability would be met. It is noted that Energy Australia's network has N-1 redundancy. Also, the developer would effectively become a Supply Authority with contractural obligations to building owners and would need to draft policy documents, for sale agreements etc. as required by the Regulatory Tribunal.

It is likely that some augmentation of the Energy Australia network would still be required, as backup / redundancy from the Grid would be desirable; also depending on the size of the plant Grid offsets may be only partial.

# 4.0 Telecommunications

## 4.1 Existing Telecommunications Infrastructure

### 4.1.1 Cabled Network

Following consultation with Telstra in conjuction with Dial Before You Dig Queries (Job No. 2730876) the following has been determined:

- Telstra are currently undertaking an upgrade of the copper lead in cable installed temporarily to meet the CarriageWorks initial connection requirements. It is anticipated that the hardware upgrade will be completed by mid 2008.
- The copper lead in cable will be replaced by a multi fibre cable
- 6 conduits have been installed from Wilson Street, beneath the existing driveway/service road, and continue to the eastern end of the CarriageWorks building where they are capped off for future extension
- Telstra is not planning development of new exchanges in the locality.

### 4.1.2 Mobile Networks

Telstra have confirmed that Telstra 3G Mobile Network services are already available in the area. The network company is responsible for any development of Mobile network infrastructure required to accommodate the additional loading to the area

## 4.2 Telstra Universal Services Obligation

Telephones are considered an essential service and Telstra has the obligation under its Universal Services Obligation (USO) set out under the Federal Telecommunications (Consumer Protection and Services Standards) Act 1999, to provide to all people in Australia, reasonable access, on an equitable basis, to the standard telephone service and payphones. The standard telephone service is a service for voice telephony. This service could potentially provide dial up connectivity of up to 1.5Mbps subject to commercial negotiations with Telstra. This is provided using copper cable. Telstra is the primary universal service provider which means it has the obligation to provide this service including the installation of conduits and cables for future telephone connections. It is cost effective for the developer if the laying of cabling can be coordinated with the power and gas installation so that the services share a common trench. The separation of the services within the trench would be in accordance with Australian Standard AS/ACIF S009:2006.

Telstra is wholly responsible for standard cable infrastructure up to the point of connection to provide basic telephony services, with the developer responsible for the cost of providing a shared trench and land on the verge for a remote above ground housing (a green box on the side of the road). The shared trench would be within the standard footpath allocation and will follow the subdivision road layout.

## 4.3 Telecommunications requirements

Telecommunications network demand is calculated on a land use basis, which is performed by Telstra. To support our initial enquiries we have performed a preliminary Basic Telephony Demand calculations which forecast that 5,300 lines are required for the site. Refer table below.

| North Eveleigh Rail Yards Preliminary Telephony Assessment | | | | | |
|---|---|---|---|---|---|
| Block | Building | GFA Mix | | | |
| | | Residential | Commercial | Retail | Cultural |
| | | no.pairs | no. pairs | no. pairs | no. pairs |
| A | A1 | 12 | | | |
| | A2 | 55 | | | |
| | A3 | 52 | | | |
| | | | | | |
| B | B1 | 70 | | | |
| | | | | | |
| C | C1 | 130 | | | |
| | C2 | 87 | | | |
| | C3 | 20 | | | |
| | C4 | 24 | | | |
| | | | | | |
| D | D1 | 87 | | | |
| | D2 | 130 | | | |
| | D3 | 22 | | | |
| | D4 | 36 | | | |
| | D5 | 43 | | | |
| | | | | | |
| E | E1 | 46 | | | |
| | E2 | 41 | | | |
| | E3 | 32 | | | |
| | | | | | |
| F | F1 | 38 | | | |
| | | | | | |
| G | G1 | 57 | | | |
| | G2 | 52 | | | |
| | | | | | |
| H | H1 | | | 25 | |
| | H2 | 30 | | | |
| | H3 | 24 | | | |
| | H4 | 30 | | | |
| | | | | | |
| J | J1 | | 545 | 10 | |
| | | | | | |
| K | K1 | | 1060 | 10 | |
| | K2 | | 971 | 10 | |
| | | | | | |
| L | L1 | | 862 | 10 | |
| | L2 | | 718 | 10 | |
| | | | | | |
| M | M1 | | 773 | 10 | |
| | M2 | | 723 | 10 | |
| | | | | | |
| N | N1 | 12 | | | |
| | N2 | | | | 50 |
| | | | | | |
| P | P1 | 5 | | | |
| | P2 | 162 | | | |
| | | | | | |
| **Masterplan Total** | | **1296** | **5653** | **95** | **50** |

The new Fibre Optic Cable will have a total capacity of 60 fibres. 12 fibres will be installed initially, and 2 out of these 12 will be connected to the CarriageWorks Main Distribution Frame

Each Optic fibre pair can carry up to 480 POTS lines + 96 ADSL-1 lines, therefore it is estimated that 12 cores will be required to provide basic telephony for entire site.

The existing 60F cable runs through the Western end of the site, and is ready for lead in cable extension to individual Telstra CMUX within building MDF's.

In order for the cable to be extended to the Eastern end, further trenching and conduit installation works are required. Telstra note that the route from Redfern exchange is prohibitive thus it is likely that the existing Redfern/newtown exchange delineation will be reformed to allow the site to be serviced from Newtown Exchange only

The current easement is within the existing Service Road and runs parallel to the western boundary and then turns to run parallel to Wilson Street. The Road is reworked in the Concept Plan, therefore the easement will need to be re-aligned with the new roadway and assets relocated accordingly. Refer to Drawing E201 in the Appendix for details.

## 4.4 Telstra Non Standard Deployment

Subject to commercial negotiation Telstra are able to provide non standard fibre optic deployment to the development. This would provide high speed non-contentious broadband scalable to 100 Mbps, free to air digital TV, Foxtel and fixed line services for each lot. It also provides the option of possible upgrades such as gaming, interactive education, business from home application at office speeds should the future customer require it. The Installation of fibre to each home (Fibre to the Home, FTTH) would be at the developers cost. However there will be savings to the developer in terms of the building wiring because Telstra offers a number of products and services that will not require a separate wired network(e.g Foxtel satellite needs 4 coaxial cables to each apartment).

Telstra advised (telephone conversation with Jeoffrey Keogh Telstra Urban Development Manager NSW) that developers must allow for a supply and construction time of 6 -9 months prior to the first connection date.

## 4.5 Non Telstra Carriers

Consultation with Optus in conjunction with Dial before You Dig query has determined that there are no existing cable networks in the immediate vicinity. However Optus are not bound by local exchanges to supply services thus provision of Optus fixed line and data services will be subject to private negotiations between the future developer and Optus.

Consultation with Uecomm in conjunction with Dial before You Dig query has determined that there is existing Uecomm Fibre Network within Wilson Street. A connection could be made at several pit locations within the northern footpath. Uecomm are a provider of data services only ( as opposed to basic telephony) for example, private network infrastructure for future business park tenants.

Dial Before You Dig queries have also shown that several other carriers have networks in the area; but not directly adjoining the site. These are:

- Pipe Networks
- Powertel
- VisionStream
- Primus Telecom

Generally these services would be subject to commercial negotiations directly with the provider.

# 5.0 Appendix

## 5.1 Supply Authority Contacts

### Telecommunications

**Telstra**

| | | |
|---|---|---|
| Esra Kandan | Access Forecaster NSW | (02) 9397 2046 |
| Kumar Rajaram | Capacity Planner NSW Sydney Metro South | (02) 9397 2159 |
| Jeoffrey Keogh | Telstra Smart Community Telstra Country Wide | 0419 236 124 |
| **Uecomm** | Richard Bartlett | (02) 8226 3246 |
| **Optus** | Carlo Viloria | (02) 9777 0077 |

### Power Services

**Energy Australia**

| | | |
|---|---|---|
| David Twigg | Region Manager Sydney City | (02) 9663 9526 |
| Craig Platts | Customer Supply Officer | (02) 9663 9349 |

## 5.2 Correspondence



**Wan, Jamie**

**From:** David Twigg [dtwigg@energy.com.au]
**Sent:** Wednesday, 19 March 2008 5:19 PM
**To:** Wan, Jamie; ProjectManager ProjectManager
**Cc:** Craig Platts; John Koutsounadis
**Subject:** Re: North Eveleigh HV Connection Information
**Attachments:** 080228 Minutes Minutes of meeting with Energy Australia.doc

Jack/Jamie,
The full HV connection investigation has not been completed but we do have some preliminary advice. Based on the load information you have provided, two HV cables rated at 400amps will need to be layed from the North Eveleigh development site to our St Peters zone substation on Sydney Park road. The development will be classed a "large load customer" which mandates all connection works back to the zone to be funded by the developer. The route length is approximately 2.3km. There is the potential to use some of our spare conduits that could reduce excavation costs.

I stress that this information cannot be guaranteed until the full investigation is complete it is provided as a guide for your urgent reporting requirements.

Best Regards,

David Twigg
**Region Manager - Sydney City**
***EnergyAustralia***

Building 4, 130 Joynton Ave, Zetland 2017

T. 02 9663 9526 (Extn 39526)
F. 02 9663 9499 (Extn 39499)
M. 0417 213 527
dtwigg@energy.com.au

*Please consider the environment before printing this email....*

**"Wan, Jamie" <j.wan@bassett.com.au>**

28/02/2008 04:10 PM

To "Craig Platts" <cplatts@energy.com.au>
cc "ProjectManager ProjectManager" <ProjectManager@rwa.nsw.gov.au>, <dtwigg@energy.com.au>
Subject North Eveleigh HV Connection Revised Load Information

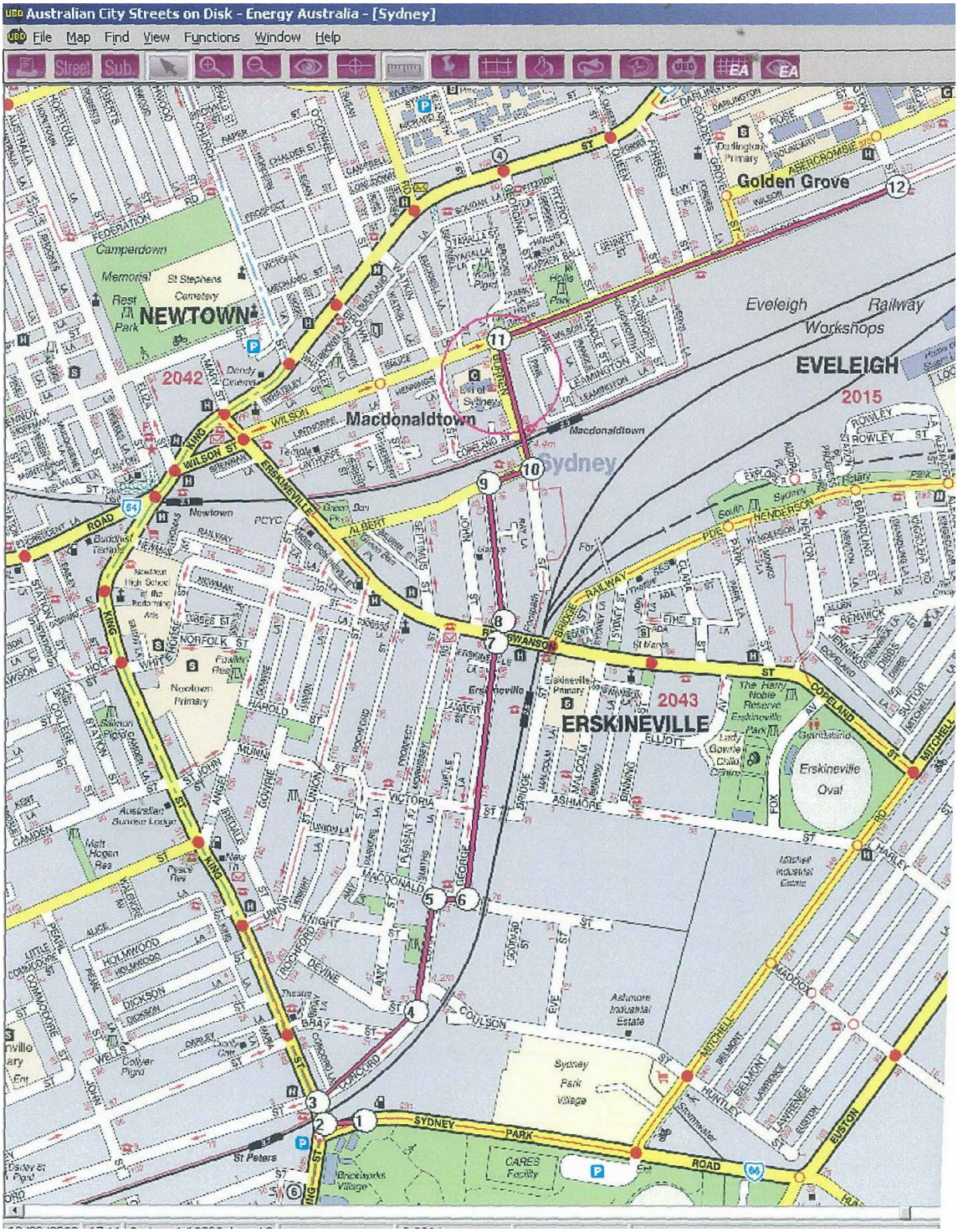
Dear Craig,
Thankyou for your time today. As discussed in our meeting please find below Revised Load Information for the North Eveleigh Site. Could you urgently forward this to HV Planning.

As discussed the energy constraints are driven by Director General Requirements and Energy Efficiency legislation

**Forecast Peak Loads**

25/03/2008

## 5.3 Preliminary 11kV Feeder Route



## 5.4 Concept Design Drawings