When I'm working on a problem, I never think about beauty. I think only how to solve the problem. But when I have finished, if the solution is not beautiful, I know it is wrong.
**Richard Buckminster Fuller**

Mechanical Engineering
Lighting Design
Sustainable Design
Electrical Engineering

Copenhagen
London
Sydney
Hong Kong
New York

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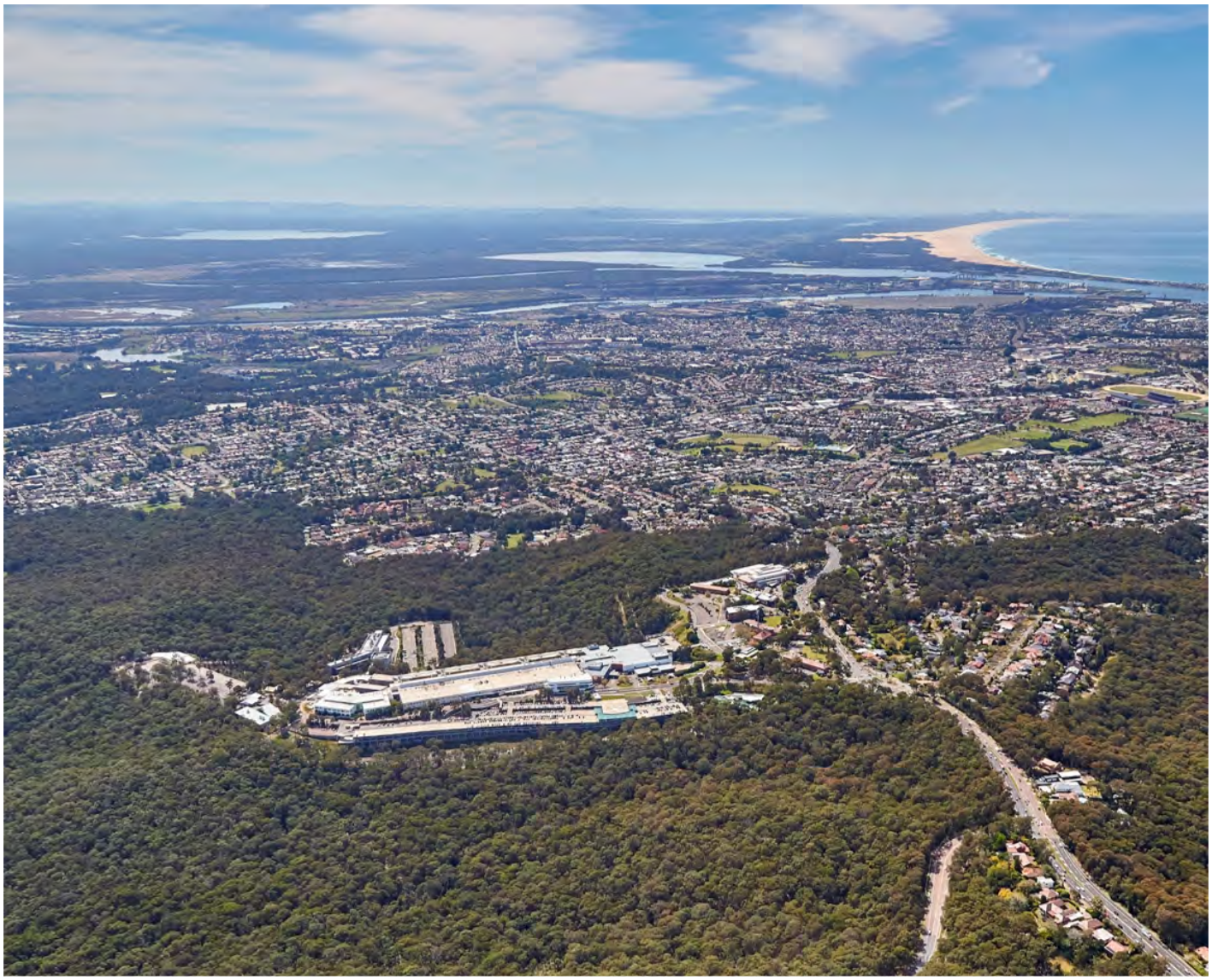
ELECTRICAL, ICT & SECURITY

STEENSEN VARMING

# John Hunter Health and Innovation Precinct SSDA
# Site Infrastructure & Analysis Report
# Electrical, ICT & Security Services



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## Document Revision and Status

| Date | Rev | Issue | Notes | Checked | Approved |
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| 31-03-2021 | A | Final | | MF | MF |

**Sydney March 31st, 2021**
Ref. No. 197069-REP-E003

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# Table of Contents

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# 1.0 SEARs Requirements

| Item | SEARS Requirement | Response - Relevant Section |
|---|---|---|
| 13(i) | Utilities<br>In consultation with relevant service providers:<br>– assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site. | Clause 5.2 High Voltage Cabling. |
| 13(ii) | identify any infrastructure upgrades required off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained | Clause 5.2 High Voltage Cabling |
| 13(iii) | Provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be co-ordinated, funded and delivered to facilitate the development. | Clause 5.2 High Voltage Cabling |
| 20 | Hazards and Risk<br>Provide:<br>- a preliminary risk screening regarding all dangerous goods and hazardous m (class, quantity and location) associated with the development. | Clause 4.2 Existing JHH Generator bulk Fuel Tank. |

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# 2.0 Description of the Proposal

## 2.1 Overview

In June 2019, the NSW Government announced a significant expansion of the John Hunter and John Hunter Children's Hospitals with the $780 million John Hunter Health and Innovation Precinct (JHHIP) project.

The JHHIP will transform healthcare services for Newcastle, the greater Hunter region and northern NSW communities. The infrastructure will provide additional inpatient capacity to the John Hunter and John Hunter Children's Hospitals and create further opportunities for partnerships with industry and higher education providers.

The JHHIP will deliver an innovative and integrated precinct with industry-leading facilities working in collaboration with health, education and research partners to meet the current and future needs of the Greater Newcastle, Hunter New England and Northern NSW regions.

The John Hunter Health and Innovation Precinct Project is being planned and designed with ongoing communication and engagement with clinical staff, operational staff, the community and other key stakeholders with a strong focus on the following:

- Patient-centred care
- Contemporary models of care
- Future economic, health and innovation development opportunities
- Environmental sustainability

## 2.2 Subject Site

The John Hunter Health Campus (JHHC) is located on Lookout Road, Lambton Heights, within the City of Newcastle Local Government Area (LGA), approximately 8km west of the Newcastle CBD. The hospital campus is located approximately 3.5km north of Kotara railway station.

The JHHC comprises the John Hunter Hospital (JHH), John Hunter Children's Hospital (JHCH), Royal Newcastle Centre (RNC), the Rankin Park Rehabilitation Unit and the Nexus Unit (Children & Adolescent Mental Health). JHHC is a Level 6 Principal Referral and tertiary Hospital, providing the clinical hub for medical, surgical, child and maternity services within the Hunter New England Local Health District (HNELHD) and across northern NSW through established referral networks. Other services at the campus include the Hunter Medical Research Institute (HMRI), Newcastle Private Hospital and the HNELHD Headquarters.

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## 2.3 SSDA Proposal

Approval is being sought for a new Acute Services Building and refurbishment of existing hospital facilities at John Hunter Hospital comprising:

- Construction and operation of a new seven-storey Acute Services Building (plus 4 semi-basement levels) to provide:
  - an expanded and enhanced Emergency Department;
  - expanded and enhanced medical imaging services;
  - expanded and enhanced intensive care services - Adult, Paediatric and Neonatal;
  - expanded and enhanced Operating Theatres including Interventional Suites;
  - an expanded Clinical Sterilising Department;
  - Women's Services including Birthing Unit, Day Assessment Unit and Inpatient Units;
  - integrated flexible education and teaching spaces;
  - expanded support services;
  - associated retail spaces;
  - new rooftop helipads;
  - new semi-basement car parking;
- Refurbishment of existing buildings to provide:
  - additional Inpatient Units;
  - expanded support services;
- A new Hospital entry canopy and works to the existing drop off;
- Link bridge to the Hunter Medical Research Institute (HMRI);
- Campus wayfinding and signage;
- Landscape works;
- Site preparation including bulk earthworks, tree removal, environmental clearing, cut and fill;
- Mines grouting remediation works;
- Construction of internal roads network and construction access roads and works to existing at-grade carparking;
- Connection to the future Newcastle Inner City Bypass; and
- Inground building services works and utility adjustments.

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# 3.0 Existing Services

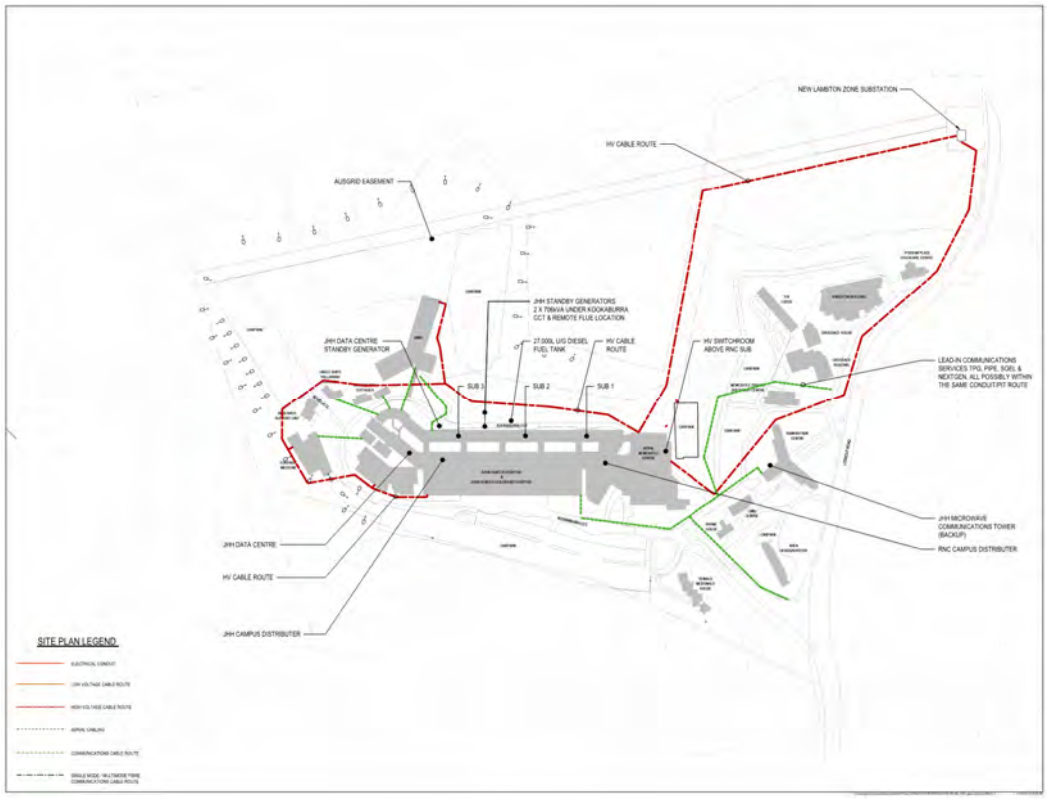
The existing site infrastructure services to the John Hunter Health Campus are listed below and indicated on the below plan.

**High Voltage Network**
The John Hunter health campus is a high voltage customer. The existing high voltage network comprises three incoming high voltage supplies, two from the New Lambton Zone Substation and one back-up feeder from the Kotara Zone Substation. The two HV feeders from New Lambton Zone Substation are rated at 800Amp and the Kotara HV feeder is rated at 400Amps.
The John Hunter Health campus is internally serviced by two high voltage rings:

One serves the John Hunter Hospital substations 1, 2 and 3.
The other serves the RNC, HMRI, Forensic and HAPS buildings.

The existing high voltage switch room is located above the RNC chamber substation and was constructed approx. 2008, the high voltage switchgear is in good condition. The existing high voltage network has capacity to accommodate the power requirements of the ASB.

**Communication Infrastructure**
The JHH Campus has a telecommunication lead-in route accommodating telecommunications services from telecommunication carriers including TPG/Pipe/Soul, NextGen, Optus and Telstra Qwip. These lead-in services support the voice, data and HWAN services to the existing health campus.



*Existing Site Plan*

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# 4.0 ASB Site Clearing Works

## 4.1 Overview

Prior to the commencement of the ASB construction works the below list of enabling works packages are required to clear the construction zone.

- Divert existing high voltage Ring 2 between the Royal Newcastle Centre high voltage switch room to the Hunter Medical Research Institute building - Refer clause 4.1.1.
- Remove and divert existing low voltage and communications cabling associated with the HMRI / JHH north western car park, adjustment to Kookaburra Cct and construction of the second access road. – Refer clause 4.1.2.
- Relocation of JHH standby diesel generators exhaust flues, air intake and resistive load bank. - Refer clause 4.1.3.

As the John Hunter Hospital health campus is a high voltage customer, none of the above works impact Ausgrid the power Utility infrastructure.

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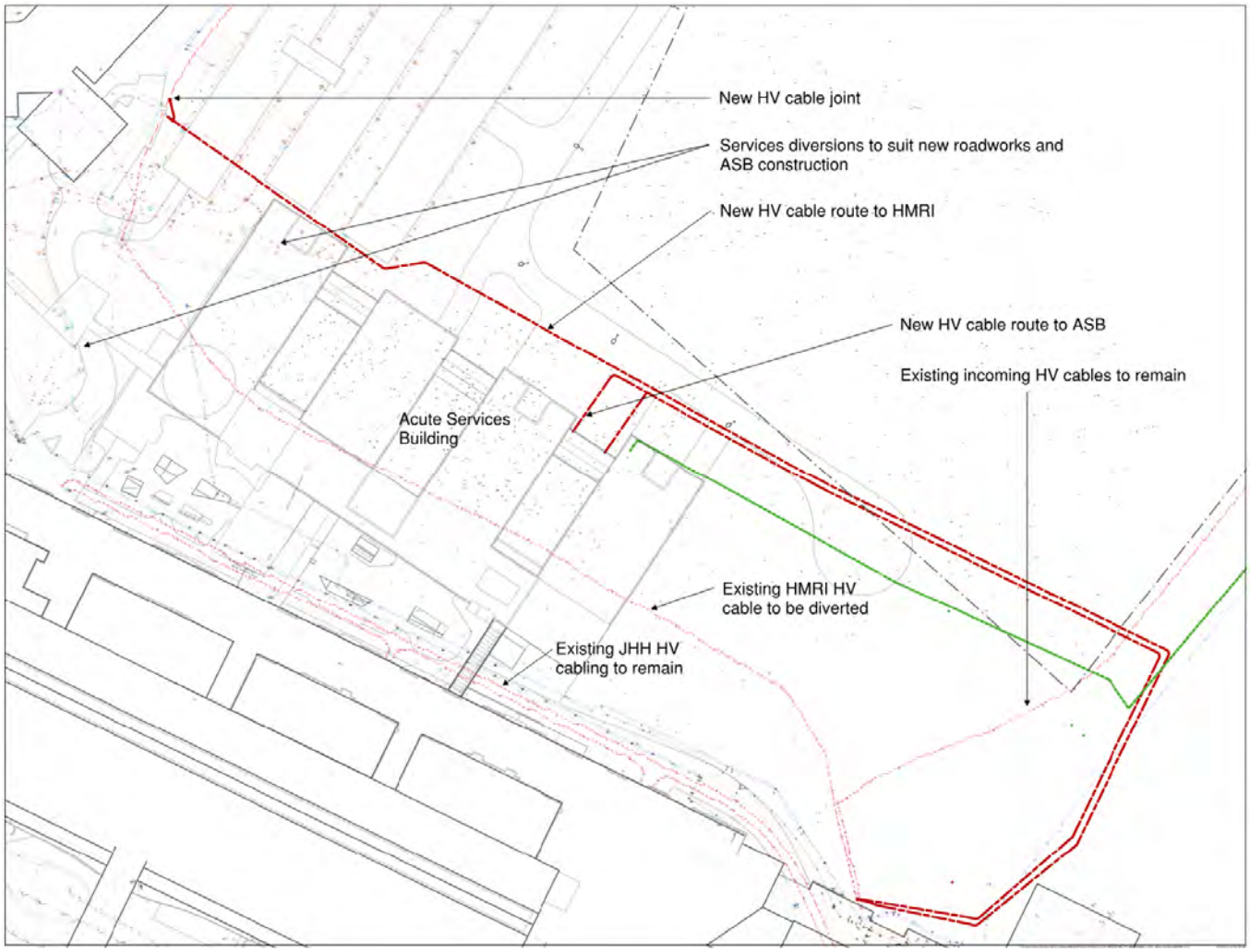
## 4.1.1 High Voltage Ring

Divert existing high voltage Ring 2 between the RNC high voltage switch room to the HMRI building, from within the ASB excavation zone.

A section on the existing high voltage cable ring that lay between the RNC building and the HMRI building is required to be diverted as it is located within the excavation zone of the ASB. It is proposed to provide a new high voltage cable around the ASB excavation zone to facilitate the construction of the Acute Services Building.




*Proposed HMRI High Voltage Cable Diversion*

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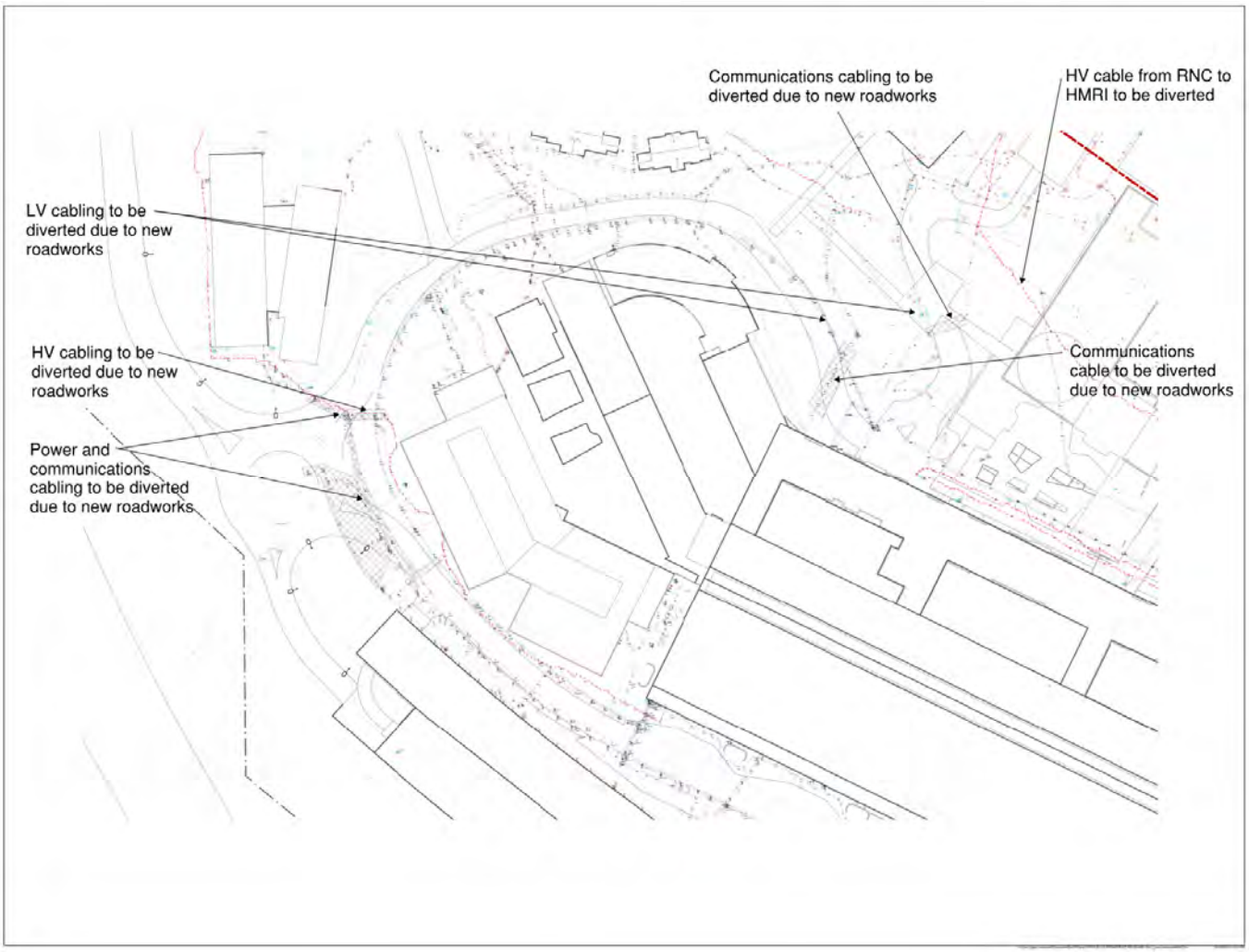
## 4.1.2 Services Diversions associated with Kookaburra Cct and Car Park

Remove and divert existing low voltage and communications cabling associated with the HMRI / JHH north western car park and adjustments to Kookaburra Cct.

The construction zone of the Acute Service Building and associated new roadworks impacts the southern end of the existing HMRI car park and the western end of Kookaburra Cct. The existing low voltage power services for the car park boom gates & lighting, as well as the communication services serving the security cctv camera and intercoms, will be diverted to facilitate the construction works and to suit the new car park arrangement.

Further west, the proposed new access road works will impact existing power (high voltage & low voltage) and communication inground services, which will require relocation and diversion to accommodate the change in road levels and alignment.




*Proposed Services diversion associated with Access Road, Kookaburra Cct and HMRI Car Park*

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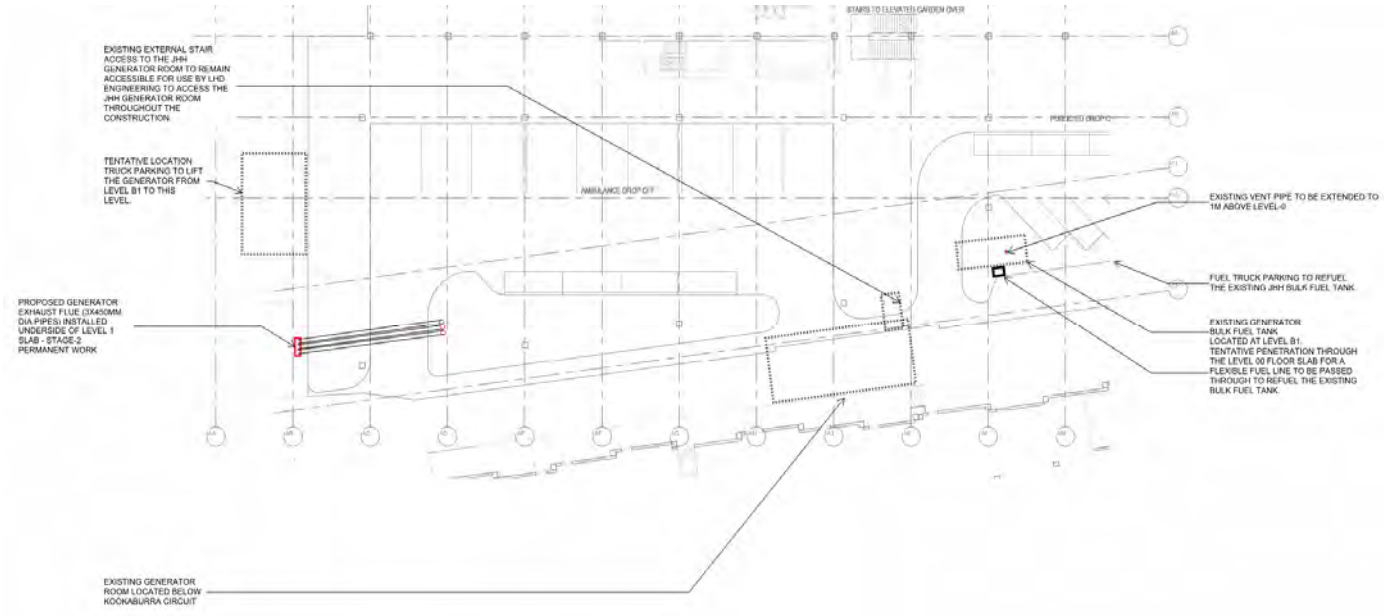
## 4.1.3 JHH Standby Diesel Generator Exhaust Flues & Air Intake

It is proposed that the existing JHH standby diesel generators are retained below Kookaburra Cct, together with the existing underground bulk fuel tank. The existing exhaust flues, resistive load bank and are intake are to be relocated from the construction footprint.

There are three 706kVA standby diesel generators located within a dedicated generator room below Kookaburra Cct. There are three exhaust flues that extend north from the generator room to the flue riser position located within the bush approximately 50m from the generator room. These exhaust flues will be relocated / replaced to a new location further West to be clear of the JHH and Acute Services Building.




*Proposed relocated JHH Generator Exhaust Flues*

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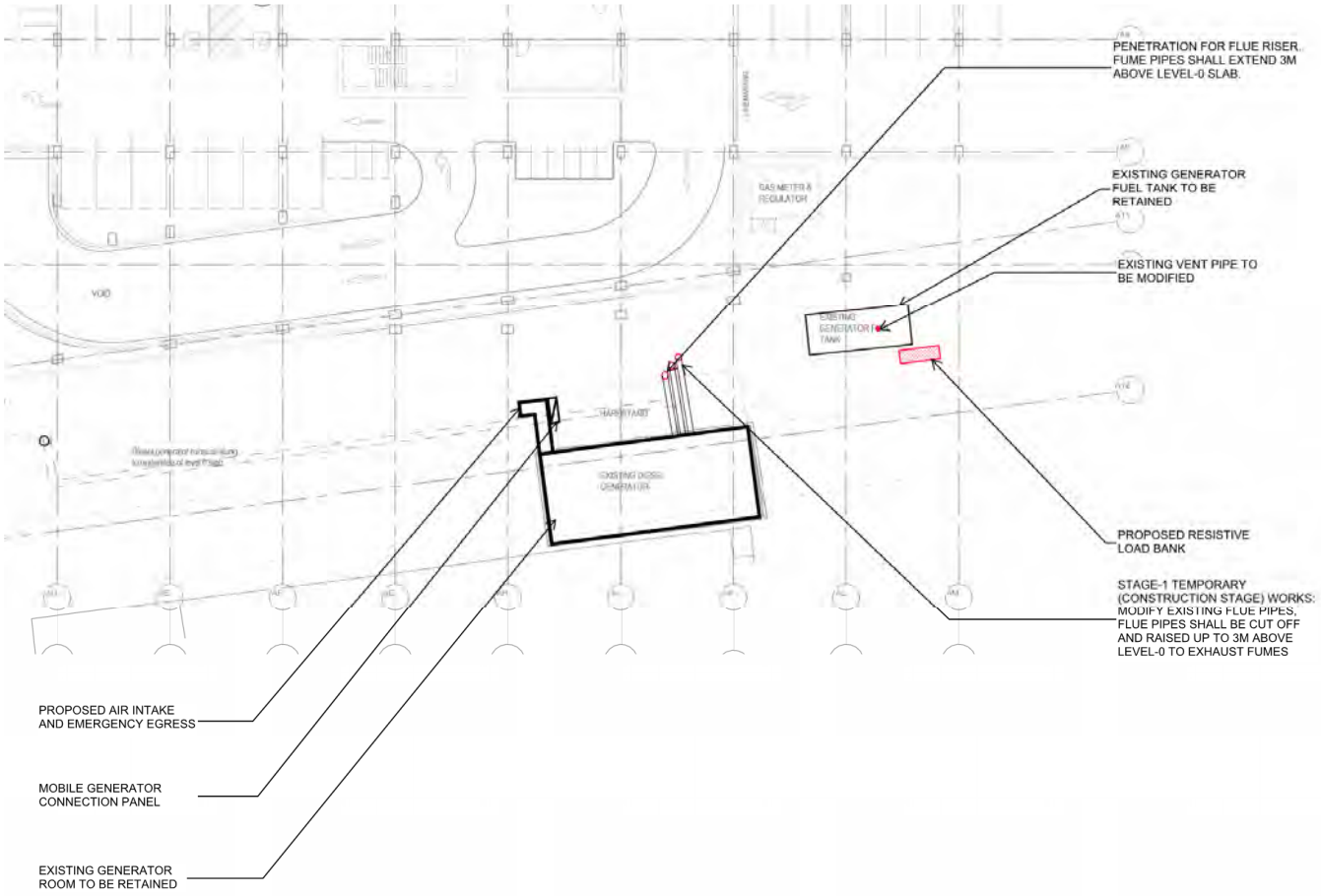
**Existing JHH Generator Resistive Load Bank**

The existing air intake and resistive load back will be impacted by the construction of the ASB. The air intake will be modified to reduce its length clear of the excavation and construction of the ASB. The resistive load bank will be relocated clear of the ASB construction zone.




*Proposed Locations of the Air Intake and Resistive Load Bank*

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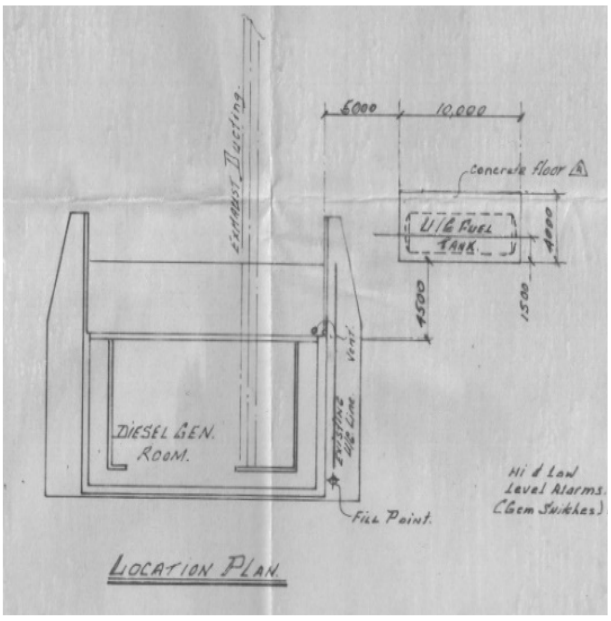
**Existing JHH Generator Bulk Fuel Tank**

The existing JHH generator bulk fuel tank is located underground adjacent Kookaburra Cct.
The generator fuel supply line was acid cleaned about three years ago. The fuel tank is serviced, and fuel filtered and treated every 12 months. Integrity testing on the fuel tank was carried out April 2017 and the tank passed with no issues highlighted.
The location of the fuel tank is not affected by ASB excavation works so it can remain in its existing location.




*Bulk Fuel Tank Location*

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# 5.0 Project Works

## 5.1 Overview

The following overview of the ASB and car park works is provided so a holistic understanding of the entire project can be formulated.

- Provision of new high voltage connection from the high voltage switch room within the RNC building to the ASB.
- Construct the Acute Services Building and car park
- Refurbishment of spaces within the existing John Hunter Hospital.
- External works associated with the upgraded JHH southern main entrance.
- The project includes for the full site development including northern road network that will be delivered as part of a phased development. The 'initial phase' will enable the project to meet timelines for the ASB to be operational and provide critical health services for the region. The later 'North Road – East Phase' completes the campus wide infrastructure setting up the delivery of the future precinct vision.

## 5.2 High Voltage Cabling

Ausgrid have assessed the proposed additional load of the ASB on the Ausgrid high voltage network and advised that there are no issues to accommodate this additional load. Ausgrid have advised that no additional offsite infrastructure works are required to connect the ASB load to the Ausgrid network.

The existing high voltage switch room is located above the RNC chamber substation and was constructed approx. 2008. The existing high voltage switchgear consists of Schneider withdrawable circuit breakers arranged in two groups with interconnection switch. There are two space circuit breakers on the HV switchgear which will be used to connect to new high voltage cable to the Acute Services Building.

## 5.3 Refurbishment with JHH

As part of the project, there are a number of areas within the existing John Hunter Hospital that will be refurbished as part of the works. The existing internal electrical and communications services will be upgraded and or modified to incorporate the internal fitout requirements.

## 5.4 JHH Southern Entrance

The works will incorporate adjustments to the external space of the JHH main entrance. This work may impact the minor inground electrical and communication services within this vicinity.

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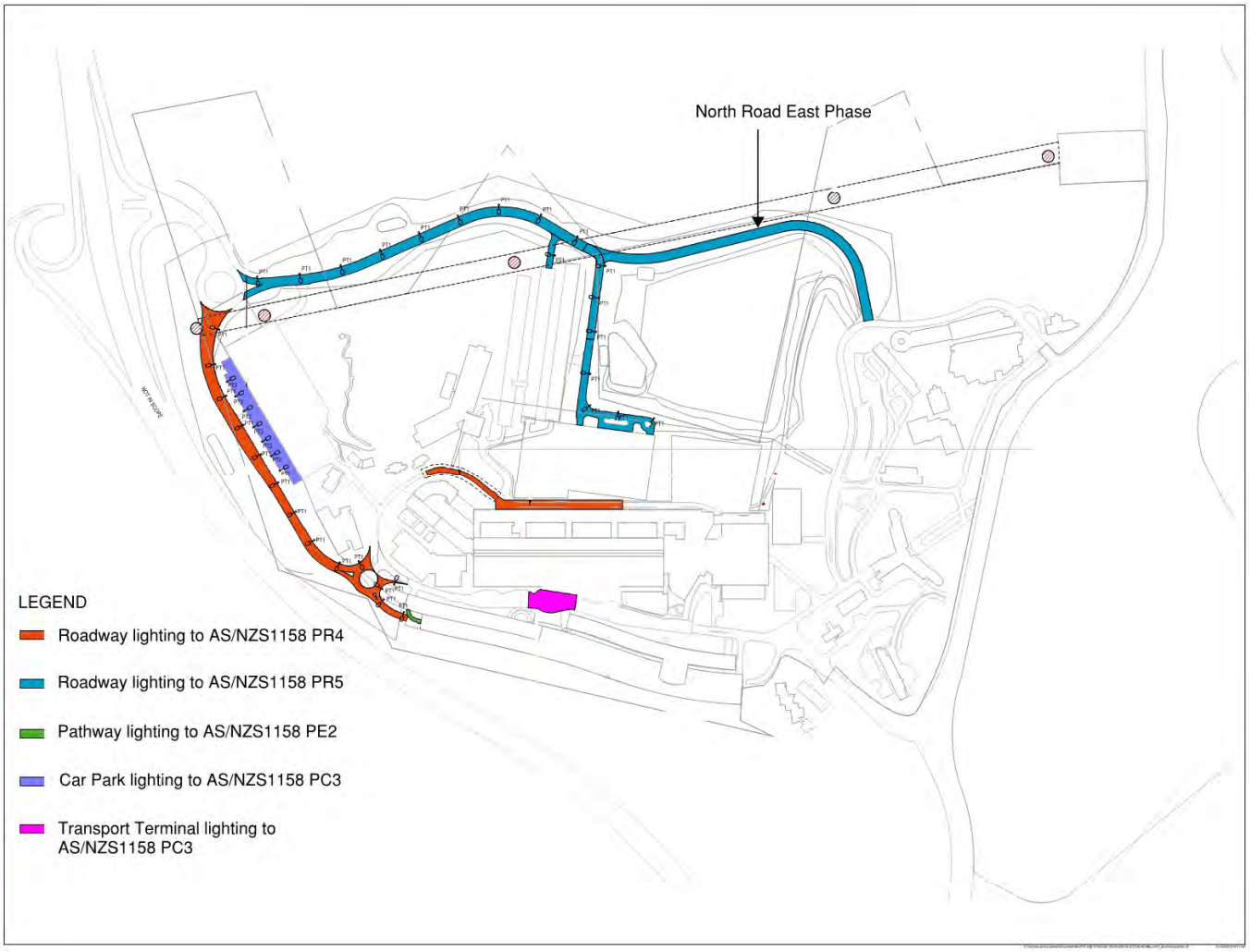
## 5.5 Access Road Lighting

New Access Road lighting will be provided to illuminate the new access roads from approximately 15m inside the TfNSW Bypass roundabout, to illuminate the access roads leading to the health campus. It is proposed that all new external street and car park lighting will be 'full cut-off' type, thereby directing all light to the ground. This lighting approach will prevent any direct light spill to adjacent properties.




*Proposed new Access Road Lighting*

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# 6.0 Appendix A

Appendix A incorporates the preliminary enabling works drawings as listed below.

- Existing Services Site Plan.
- Services Diversions Northern Site Plan.
- Services Diversions Western Site Plan.
- Site Plan – Proposed External Lighting.

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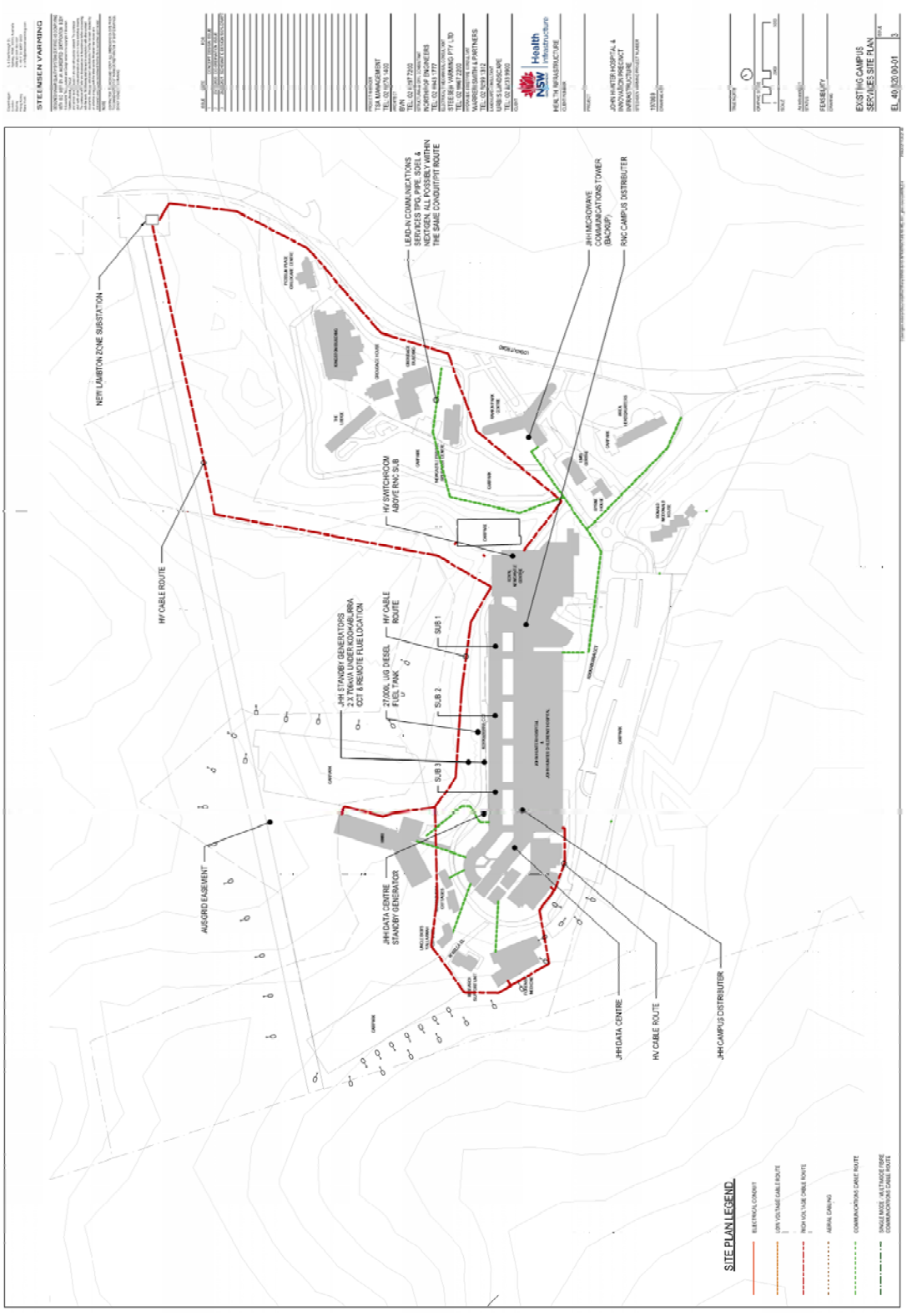

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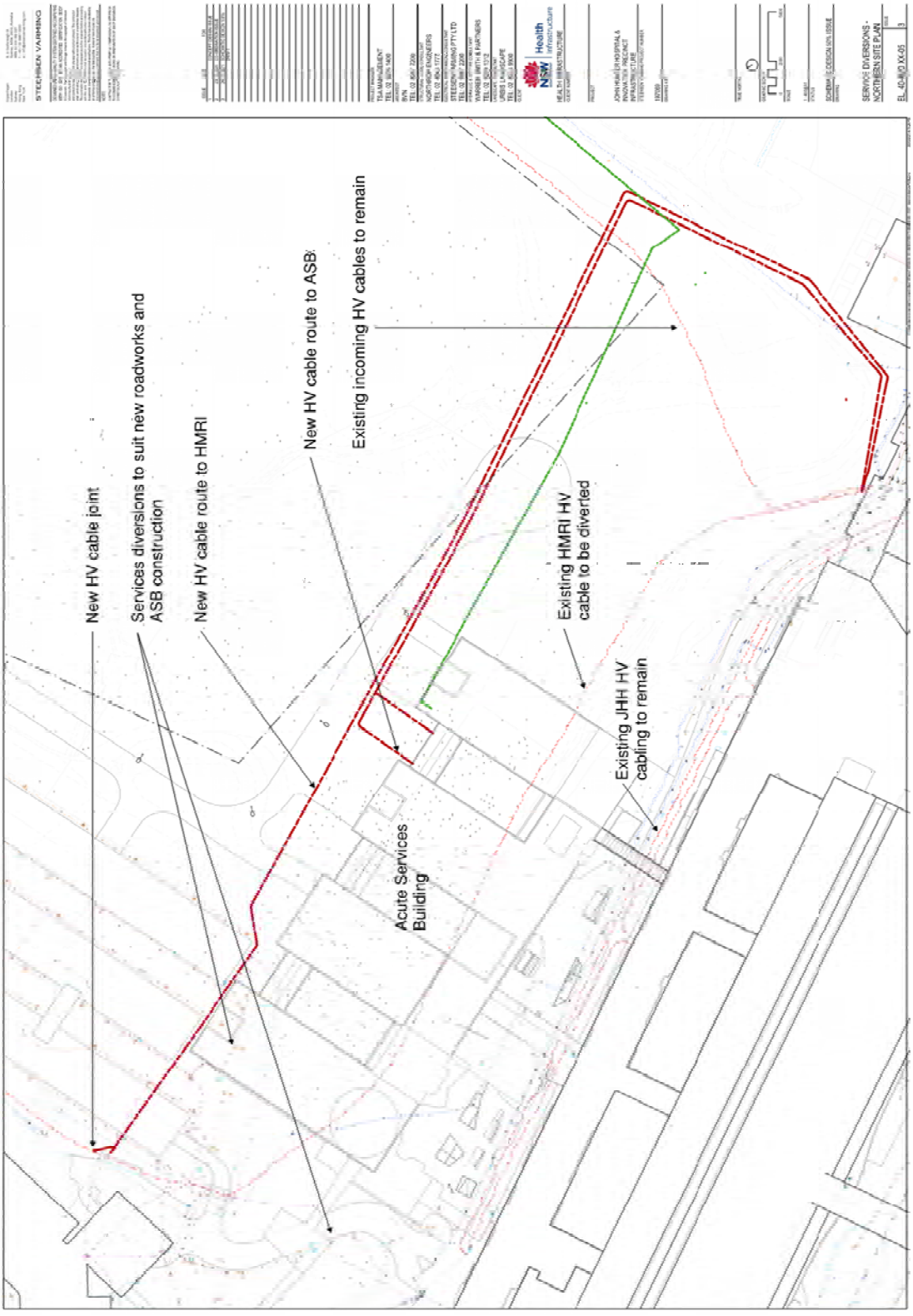

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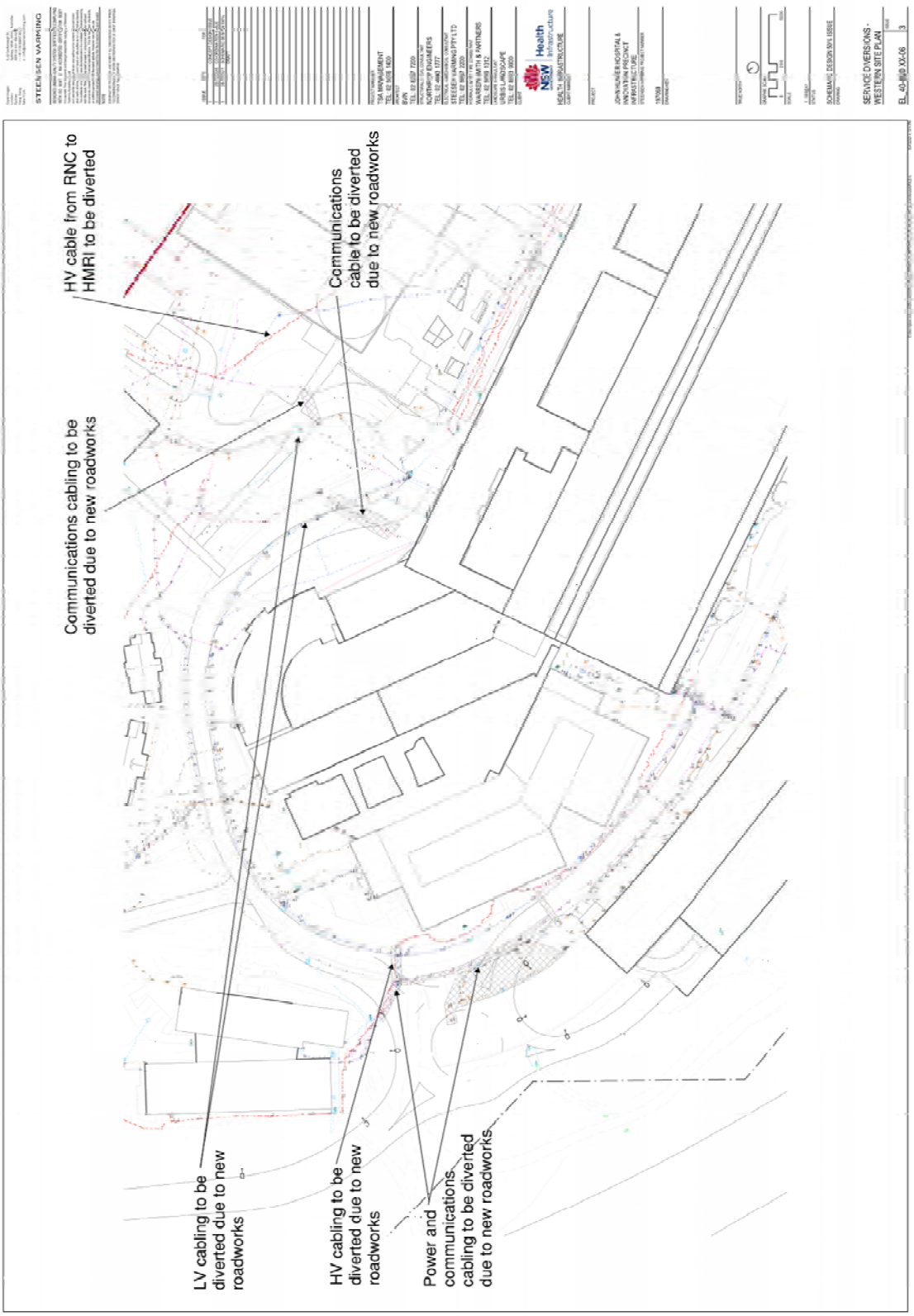

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