

Moorebank Precinct East - Stage 2 Proposal

Utilities Strategy Report



SIMTA

SYDNEY INTERMODAL TERMINAL ALLIANCE

Part 4, Division 4.1, State Significant
Development

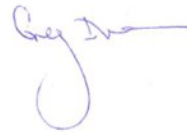
MOOREBANK PRECINCT EAST STAGE 2

Utilities Strategy Report

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1 INTRODUCTION

Concept Plan Approval (MP 10_0193) for an intermodal terminal (IMT) facility at Moorebank, NSW (the Moorebank Precinct East Project (MPE Project) (formerly the SIMTA Project)) was received on 29 September 2014 from the NSW Department of Planning and Environment (DP&E). The Concept Plan for the MPE Project involves the development of an IMT, including a rail link to the Southern Sydney Freight Line (SSFL) within the Rail Corridor, warehouse and distribution facilities with ancillary offices, a freight village (ancillary site and operational services), stormwater, landscaping, servicing, associated works on the eastern side of Moorebank Avenue, Moorebank, and construction or operation of any part of the project, which is subject to separate approval(s) under the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This Environmental Impact Statement (EIS) is seeking approval, under Part 4, Division 4.1 of the EP&A Act, for the construction and operation of Stage 2 of the MPE Project (herein referred to as the Proposal) under the Concept Plan Approval for the MPE Project, being the construction and operation of warehouse and distribution facilities.

This EIS has been prepared to address:

- The Secretary's Environmental Assessment Requirements (SEARs) (SSD 16-7628) for the Proposal, issued by NSW DP&E on 27 May 2016 (Appendix A).
- The relevant requirements of the Concept Plan Approval MP 10_0913 dated 29 September 2014 (as modified) (Appendix A).
- The relevant requirements of the approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (No. 2011/6229, granted in March 2014 by the Commonwealth Department of the Environment (DoE)) (as relevant) (Appendix A).

This EIS also gives consideration to the MPE Stage 1 Project (SSD 14-6766) including the mitigation measures and conditions of consent as relevant to this Proposal.

This EIS has been prepared to provide a complete assessment of the potential environmental impacts associated with the construction and operation of the Proposal. This EIS proposes measures to mitigate these issues and reduce any unreasonable impacts on the environment and surrounding community.

1.1 Report purpose

This report supports the Environmental Impact Statement (EIS) for the Proposal (refer to Section 1.2 below for an overview of the Proposal) and has been prepared as part of a State Significant Development (SSD) Application for which approval is sought under Part 4, Division 4.1 of the EP&A Act.

This report has been prepared to address:

- The Secretary's Environmental Assessment Requirements (SEARs) (SSD 16-7628) for the Proposal, issued by NSW DP&E on 27 May 2016.
- The relevant requirements of Concept Plan Approval MP 10_0913 dated 29 September 2014 (as modified).
- The relevant requirements of the approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (No. 2011/6229, granted in March 2014 by the Commonwealth Department of the Environment (DoE)) (as relevant).

The SEARs and the Concept Plan Conditions of Approval and Statement of Commitments relevant to this study, and the section of this report where they have been addressed are provided in *Table 1* and *Table 2* respectively.

Table 1: Secretary's Environmental Assessment Requirements relevant to this study

Section	Environmental Assessment Requirement	Where addressed in this report
16. Property and infrastructure	b) Assessing the service demand, capacity and augmentation of existing and proposed utilities and infrastructure, including any relocation as a result of the development.	This Report

Table 2 Concept Plan conditions of approval and Statement of Commitments relevant to this study

Section	Environmental Assessment Requirement	Where addressed in this report
Concept Plan Conditions of Approval		
There are no Concept Plan Conditions of Approval that specifically relate to utilities.		
Concept Plan Statement of Commitments		
Utilities	The Proponent will undertake further investigations, as required, and provide details that adequate services are available to the site and/or provide details regarding servicing upgrades. Details are to be provided with the applications for each future stages of the development.	Appendix B of this report

1.2 Overview of the Proposal

The Proposal involves the construction and operation of Stage 2 of the MPE Project, comprising warehousing and distribution facilities on the MPE site and upgrades to approximately 1.4 kilometres of Moorebank Avenue between the northern MPE site boundary and 120 metres south of the southern MPE site boundary.

Key components of the Proposal include:

- Warehousing comprising approximately 300,000m² GFA, additional ancillary offices and the ancillary freight village
- Establishment of an internal road network, and connection of the Proposal to the surrounding public road network

Ancillary supporting infrastructure within the Proposal site, including:

- Stormwater, drainage and flooding infrastructure
- Utilities relocation and installation
- Vegetation clearing, remediation, earthworks, signage and landscaping
- Subdivision of the MPE Stage 2 site

The Moorebank Avenue upgrade would be comprised of the following key components:

- Modifications to the existing lane configuration, including some widening
- Earthworks, including construction of embankments and tie-ins to existing Moorebank Avenue road level at the Proposal's southern and northern extents
- Raking of the existing pavement and installation of new road pavement
- Establishment of temporary drainage infrastructure, including temporary basins and / or swales
- Raising the vertical alignment by about two metres from the existing levels, including kerbs, gutters and a sealed shoulder
- Signalling and intersection works
- Upgrading existing intersections along Moorebank Avenue, including:
 - Moorebank Avenue / MPE Stage 2 access
 - Moorebank Avenue / MPE Stage 1 northern access
 - Moorebank Avenue / MPE Stage 2 central access
 - MPW Northern Access / MPE Stage 2 southern emergency access

The Proposal would interact with the MPE Stage 1 Project (SSD_6766) via the transfer of containers between the MPE Stage 1 IMT and the Proposal's warehousing and distribution facilities. This transfer of freight would be via a fleet of heavy vehicles capable of being loaded with containers and owned by SIMTA. The fleet of vehicles would be stored and used on the MPE Stage 2 site, but registered and suitable for on-road use. The Proposal is expected to operate 24 hours a day, seven days per week.

An overview of the Proposal is shown in *Figure 1*. To facilitate operation of the Proposal, the following construction activities would be carried out across and surrounding the Proposal site (area on which the Proposal is to be developed):

- Vegetation clearance
- Remediation works
- Demolition of existing buildings and infrastructure on the Proposal site
- Earthworks and levelling of the Proposal site, including within the terminal hardstand
- Drainage and utilities installation
- Establishment of hardstand across the Proposal site, including the terminal hardstand
- Construction of a temporary diversion road to allow for traffic management along the Moorebank Avenue site during construction (including temporary signalised intersections adjacent to the existing intersections) (the Moorebank Avenue Diversion Road)
- Construction of warehouses and distribution facilities, ancillary offices and the ancillary freight village
- Construction works associated with signage, landscaping, stormwater and drainage works.

Construction works associated with signage, landscaping, stormwater and drainage works. The Proposal would operate 24 hours a day, 7 days a week.

The footprint and operational layout of the Proposal are shown on Figure 1.

1.3 Key terms relevant to the Proposal

Table 3 provides a summary of the key terms relevant to the Proposal, which are included throughout this report.

Table 3 Summary of key terms used throughout this document

Term	Definition
General terms	
The Moorebank Precinct	Refers to the whole Moorebank intermodal precinct, i.e. the MPE site and the MPW site
Moorebank Precinct West (MPW) Project (formerly the MIC Project)	The MPW Intermodal Terminal Facility as approved under the MPW Concept Plan Approval (SSD_5066) and the MPW EPBC Approval (No. 2011/6086).
Moorebank Precinct West (MPW) site (formerly the MIC site)	The site which is the subject of the MPW Concept Plan Approval, MPW EPBC Approval and MPW Planning Proposal. The MPW site does not include the rail link as referenced in the MPW Concept Plan Approval or MPE Concept Plan Approval.
Moorebank Precinct East (MPE) Concept Plan Approval (formerly the SIMTA Concept Plan Approval)	MPE Concept Plan Approval (SSD_0193) granted by the NSW Department of Planning and Environment on 29 September 2014 for the development of former defence land at Moorebank to be developed in three stages; a rail link connecting the site to the Southern Sydney Freight Line, an intermodal terminal, warehousing and distribution facilities and a freight village.
Moorebank Precinct East (MPE) Project (formerly the SIMTA Project)	The MPE Intermodal Terminal Facility, including a rail link and warehouse and distribution facilities at Moorebank (eastern side of Moorebank Avenue) as approved by the Concept Plan Approval (MP 10_0913) and the MPE Stage 1 Approval (14_6766).
Moorebank Precinct East (MPE) Site (formerly the SIMTA Site)	Including the former DSND site and the land owned by SIMTA which is subject to the Concept Plan Approval. The MPE site does not include the rail corridor, which relates to the land on which the rail link is to be constructed.
Statement of Commitments (SoC)	Recommendations provided in the specialist consultant reports prepared as part of the MPE Concept Plan application to mitigate environmental impacts, monitor environmental performance and/or achieve a positive environmentally sustainable outcome in respect of the MPE Project. The Statement of Commitments have been proposed by SIMTA as the Proponent of the MPE Concept Plan Approval.
MPE Stage 1 Project-specific terms	
Rail Corridor	Area defined as the 'Rail Corridor' within the MPE Concept Plan Approval.
Rail Link	The rail link from the South Sydney Freight Line to the MPE IMEX Terminal, including the area on either side to be impacted by the construction works included in MPE Stage 1.

Term	Definition
MPE Stage 1 Project	Stage 1 (14-6766) of the MPE Concept Plan Approval for the development of the MPE Intermodal Terminal Facility, including the rail link at Moorebank. This reference also includes associated conditions of approval and environmental management measures which form part of the documentation for the approval.
MPE Stage 1 site	Includes the MPE Stage 1 site and the Rail Corridor, i.e. the area for which approval (construction and operation) was sought within the MPE Stage 1 Proposal EIS.
MPE Stage 2 specific terms	
MPE Stage 2 Proposal/ the Proposal	The subject of this EIS; being Stage 2 of the MPE Concept Plan Approval including the construction and operation of 300,000m ² of warehousing and distribution facilities on the MPE site and the Moorebank Avenue upgrade within the Moorebank Precinct.
MPE Stage 2 site	The area within the MPE site which would be disturbed by the MPE Stage 2 Proposal (including the operational area and construction area). The MPE Stage 2 site includes the former DSND site and the land owned by SIMTA which is subject to the MPE Concept Plan Approval. The MPE site does not include the rail corridor, which relates to the land on which the rail link is to be constructed.
The Moorebank Avenue site	The extent of construction works to facilitate the construction of the Moorebank Avenue upgrade.
The Moorebank Avenue upgrade	Raising of the vertical alignment of Moorebank Avenue for 1.5 kilometres of its length by about two metres, from the northern boundary of the MPE site to approximately 120 metres south of the MPE site. The Moorebank Avenue upgrade also includes upgrades to intersections, ancillary works and the construction of an on-site detention basin to the west of Moorebank Avenue within the MPW site.
Construction area	Extent of construction works, namely areas to be disturbed during the construction of the MPE Stage 2 Proposal (the Proposal).
Operational area	Extent of operational activities for the operation of the MPE Stage 2 Proposal (the Proposal).

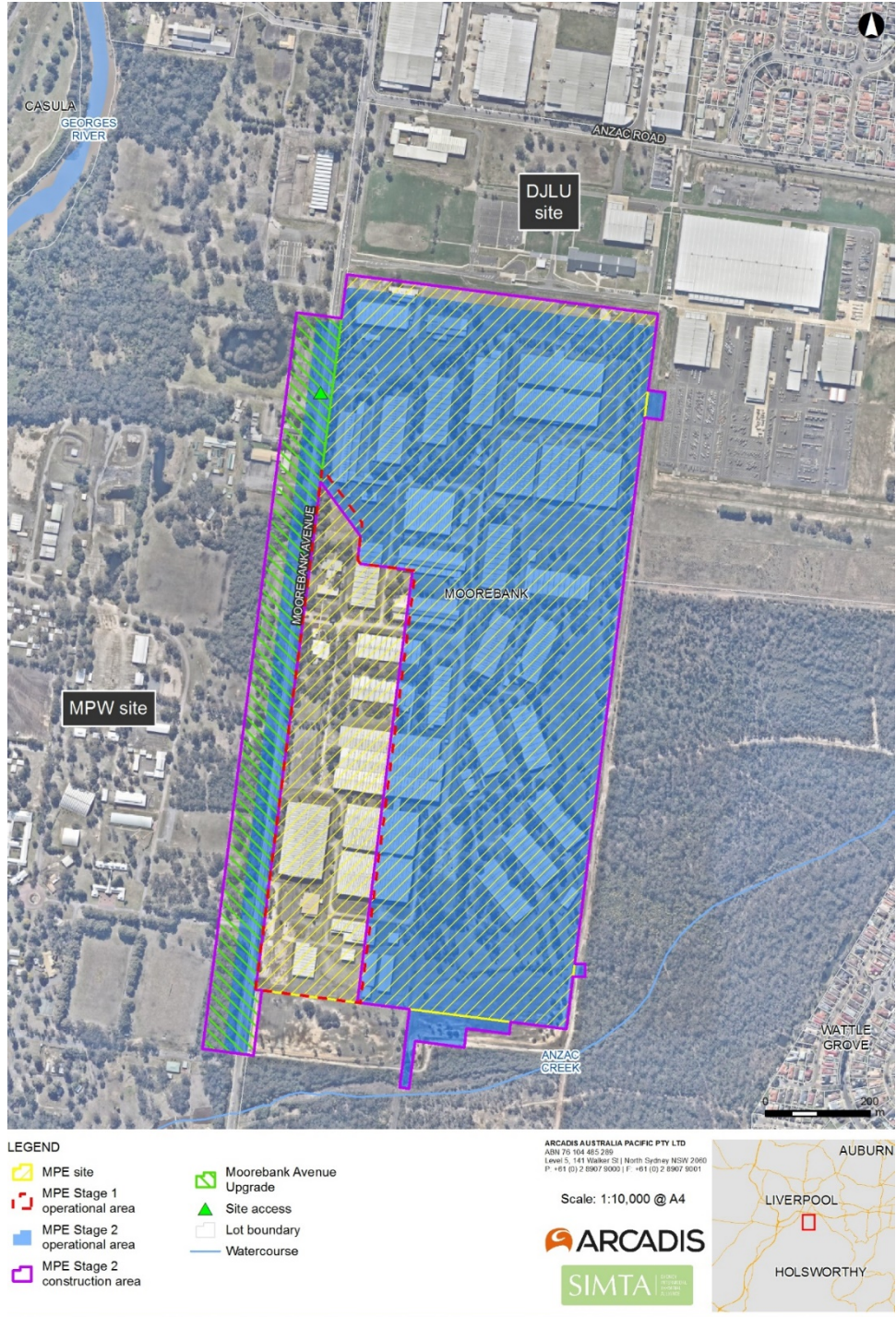


Figure 1 Overview of the Proposal

2 REPORT OVERVIEW

To support the EIS for the Proposal, Arcadis was engaged to prepare this Utilities Strategy Report to complete the following tasks:

- An assessment of the services demand, capacity augmentation of existing and proposed utilities and infrastructure affected by the development; and
- A concept design relating to infrastructure of the building services.

The outcome of this utilities investigation is that all necessary major utilities can be made available to service the Proposal. The services for the Proposal would be extended from the connections provided within MPE Stage 1.

This Building Services concept design outlines the proposed following services:

- Electrical, including Communications and Security;
- Hydraulics and
- Fire Protection.

The concept services reticulation plans are located in Appendix A of this report.

The information used in this report is based on:

- Architectural drawing prepared by Reid Campbell and provided in Appendix D of the MPE Stage 2 EIS
- Dial Before You Dig request (26/10/2016)
- A site inspection of the Proposal site and surrounds.
- Formal correspondence from the major utility providers: Sydney Water, Endeavour Energy, Jemena and Telstra, regarding the Proposal.
- Moorebank Avenue Detail Design. Civil Works. 35% design documentation, by Arcadis
- SIMTA Intermodal Terminal Facility – Stage 1 Utilities Strategy Report (AECOM, 2015) provided in Appendix B
- Moorebank – IMEX Stage 1. 35% design documentation, by AECOM
- Survey by Cardno dated 23/09/2016

3 OVERVIEW OF UTILITIES

3.1 Utilities in Moorebank Avenue

The investigation of the existing services in the Moorebank Avenue road corridor in the vicinity of the MPE site has been undertaken based on the survey and DBYD search, available as-built drawings.

A summary of the existing services in the Moorebank Avenue road corridor between Anzac Road and the East Hills railway is provided in the Table 4.

Table 4 Existing Services

Service	Authority	Size / Material	Location on the road	Extent	Comments
Gas	Jemena	75mm NY @ 210 kPa	West	Stops at railway corridor.	To be made redundant
Water	DoD	375 mm	Ring main. East and across MPE site	Extends approx. 3 km south from the rail corridor to DoD water storage tanks*	To be made redundant
Water	DoD*	150mm CICL	West	Approx.. 1km north from railway corridor	To be made redundant
Sewer Rising Main	Sydney Water	750mm SCL	West	North and south from the development	To be retained
Water	DoD	90mm AC	East	Approx.. 1km north from railway corridor	To be made redundant
Comms	DoD fibre	100mm	East	Approx.. 1km north from railway corridor	Relocation of existing utility
Comms	Telstra	Sizes and materials vary	Vary	North and south from the development and tap-off connections to existing MPW and MPE site	Relocation of existing utility subject to further investigation and Telstra approval
Comms	Telephone frame	N/A	West	External Telecommunications frame approx. Approx.. 1km north from railway corridor	To be made redundant

Service	Authority	Size / Material	Location on the road	Extent	Comments
HV	DoD	11kV overhead	West. Overhead HV	North and south from the development and tap-off connections to existing MPW and MPE site	To be made redundant
LV	DoD	TBC	West underground	North and south from the development	To be made redundant

The services provided as part of MPE Stage 1 work in Moorebank Avenue are described in the Table 5.

Table 5 Services allowed as part of MPE stage 1 works

Service	Authority	Type	Extend
Water	Sydney Water	200mm	To be extended to MPE Stage 1 entry during or prior to MPE Stage 1 works
Sewer Rising Main	Sydney Water	90mm PE	To be extended to MPE Stage 1 entry during or prior to MPE Stage 1 works
Power	Endeavour Energy	2x11kV feeders	Endeavour Energy feeders will be extended from Anzac Village Substation to MPE Stage 1 entry during or prior to MPE Stage 1 works.
Power	Endeavour Energy	1x11kV feeder	Endeavour Energy feeder will be extended to interlink between the MPW site and the MPE site along Moorebank Ave. during or prior to MPE Stage 1 works
Comms	Telstra	Copper and/or fibre	The service will be extended in Moorebank Av. to MPE Stage 1 entry during or prior to MPE Stage 1 works.

3.2 Proposed Utilities to MPE Stage 2

MPE Stage 2 connections to services infrastructure are summarised in Table 6. All the connections generally will be made from the MPE Stage 1 site. Utility connections to the MPE Stage 1 site would be undertaken via applications made directly to the relevant utility providers and approved through their authority and delegation under Part 5 of the EP&A Act. No direct connections from the Proposal to any authority mains would be required.

Table 6 . Connections to MPE Stage 2.

Service Description	Connection
Potable Water	150mm connection to be provided from MPE Stage 1
Fire Hydrant	200mm connection to be provided from MPE Stage 1
Fire Sprinkler	315mm connection to be provided from MPE Stage 1
Sewer	100mm connection to be provided from MPE Stage 1
Electricity	Connection to be provided from MPE Stage 1
Communications	Connection to be provided from MPE Stage 1

3.3 Proposed Work

It is proposed to make redundant/ relocate the existing water, gas, power and communication services located in Moorebank Avenue from Anzac Road to the rail corridor.

Sydney Water sewer rising main will be retained and protected during Moorebank Avenue raising work subject to further discussions with Sydney Water.

The Authority water, pressure sewer, power and communication services connections to the MPE site will be undertaken during the MPE stage 1 works. Subject to agreement from Authorities to the precinct servicing strategy, no direct connections from MPE Stage 2 to any Authority main are anticipated. In the event that direct connections to Authority services is found to be necessary, these connections will be subject to review and approval by the relevant Authority providing the utility (i.e Sydney Water, Endeavour Energy etc).

4 ELECTRICAL SERVICES

4.1 Power

4.1.1 Utilities Infrastructure Strategy

High voltage infrastructure coordination

The Proposal's HV service is supplied from an internal connection to the MPE Stage 1 HV infrastructure, which includes 2 x 11kV HV feeders. Subject to warehouse tenant requirements, an additional 1 x 11kV feeder may be necessary to meet future demand, this will be determined during detailed design and if determined necessary would be undertaken via an application made directly to the utility provider and approved through their authority and delegation under Part 5 of the EP&A Act.

The MPE Stage 1 design works includes two Main Switchboards which each have allocated spare circuit breakers for the Proposal. This arrangement provides flexibility for the supply and reticulation to the Proposal.

A substation will be provided to service each warehouse with tapping onto the high voltage ring main. Refer to appendix A of this report for the layout of the proposed high voltage for the Proposal.

Demand Assessment

An assessment of the estimated electricity demand for the Proposal has been conducted to assist in determining the required infrastructure. The anticipated maximum demand for the Proposal is estimated to be 8.1 mVA.

The estimate is based on the general arrangement and the type of use. The electrical loads are based on AS/NZS 3000 Table C3 energy demand for warehouse, car parks and offices.

Table 7 Energy demand

Building/ Area	VA/m2
Warehouse	20
Associated offices	110
Associated car parks	10
Circulation roadways lighting	5

Note: This electrical demand estimate is a preliminary power demand and a detailed assessment is required before connection can occur.

4.1.2 Internal Infrastructure Strategy

A low voltage switch room will be established adjacent to each substation to provide 400V supply to each respective warehouse. Low voltage infrastructure consists of switchboards and general power which will be provided in accordance with building codes and specific requirements of tenants.

Switchboards

Switchboards will be designed to meet AS3439 and AS/NZS3000 requirements together with the specific requirements of tenants.

Cables will be designed in accordance with AS3008.1 taking into account method of installation.

A minimum of 25% spare space will be designed on all switchboards.

General Power

Power will be installed throughout the warehouses, office buildings and in external areas in accordance with tenant design briefs, room data sheets (where available) and typically for equipment and user needs. Specialised connections will be provided for building services plant and control panels as well as the equipment schedule.

4.1.3 Electrical Spatial Schedule

Table 8 Electrical spatial schedule

Description	Dimensions	Location	Comments
Substation	6m x 6m	Refer to suggested locations	Assumed to be kiosk type at this stage. To be confirmed with Endeavour Energy.
LV switch room	10m x 6m	Within each building	The switchroom can be within part of the warehouses or as a separate plantroom next to the substation. Space to be confirmed

4.2 Communications

4.2.1 Utilities Infrastructure Strategy

The Proposal's telecommunications is supplied from an internal connection to the MPE Stage 1 telecommunications infrastructure, which is anticipated to include a copper and/or fibre lead-in that will have the capacity to provide telecommunications for the whole MPE project.

The MPE Stage 1 design works includes a communications room which will include provision and allowance for the Proposal's active and passive telecommunications infrastructure. This arrangement provides flexibility for the supply and reticulation to the Proposal.

The Proposal's communications network infrastructure will consist of a conduit backbone to reticulate the network to each warehouse; the number and size of conduits is indicative at this stage and is subject to confirmation during detailed design.

4.2.2 Internal Infrastructure Strategy

Depending on the requirement of each building, both optical fibre and copper cable could be provided to satisfy each building's information technology needs. Location of the proposed communication connection points are to be confirmed in detailed design. Refer to appendix A of this report for the layout of the Proposal's communication service.

4.3 Lighting

4.3.1 Internal Infrastructure Strategy

Exterior Lighting

The exterior lighting will be provided in accordance with AS1158, AS4282, and local authority requirements. Wall-mounted aesthetic floodlights with cut off glare control lenses will be considered. A summary of the proposed lighting levels is tabled below.

Table 9: Proposed external lighting levels

Area	Lighting	Design Reference
Car park	14lx	To AS/NZS 1158 Category P11a
Circulation roadways	0.5cd/m ²	To AS/NZS 1158 Category V4
Loading dock canopy	40lx	To AS/NZS 1680.5 Loading and unloading
Service area	14lx	To AS/NZS 1680 Category P7

Interior Lighting

All lighting shall generally be designed to comply with the requirements of AS1680, and where required be supplemented to ensure comfort and safety. The following model for internal lighting is assumed at this stage. It will be assessed further during detailed design for appropriateness.

Circulation Areas	Recessed LED down lights and fluorescent wall lights are proposed subject to final selections. Circulation areas will be provided with motion sensors and dimmable ballasts (as appropriate). In addition, selected locations will be circuited such that lights will remain on 24 hours for security purposes.
Administration/ Utility/Support Areas	Energy efficient recessed/surface fluorescent and LED luminaires with prismatic diffusers will be utilised throughout. Such fittings shall be equipped with high efficiency T5 lamps and electronic ballasts consistent with ESD principles. Lighting control system (C-Bus or equal approved) will be provided to allow energy savings when the rooms are not occupied.
Workshop Areas	Suspended high bay lighting/ suspended track LED and or fluorescent lamp technology will be provided with local light switch controls.

All fluorescent and LED luminaires will utilise high colour rendering (colour corrected) lamps for enhanced lighting output and quality and shall be supplied with 4000K colour temperature.

Where general lighting will be adopted to provide task and background/ environment lighting, the illuminance levels throughout the area will not be less than those recommended by AS1680 for the task required to be carried out.

Table 10: Proposed internal lighting levels

Type of Interior	Maintained illuminance
Warehouse	240 lx
Office workstations, meeting rooms	320 lx
Lobby	160 lx
Corridor	40 lx
Store room	80 lx
Toilets, change room	80 lx

The lighting selections and specification will be confirmed during detailed design.

Emergency Evacuation Lighting

Throughout each building an emergency lighting system will be designed and installed to satisfy the relevant Australian Standard and National Construction Code. The emergency lighting system installation will comprise of exit and evacuation lighting fittings. These fitting will be self-contained, battery powered, single point type and connected into the local area lighting circuits as determined during detailed design.

Lighting provided will be generally of the following type:

- Exit Signs – LED
- Emergency Evacuation and Fire Stairs – LED
- LED - Lithium Ion.
- Plant areas – Fluorescent/ LED

An automated compliance testing facility will be provided. The building's monitoring system will communicate between the server (head end) and each connected device to determine and communicate the status of each device.

4.4 Security System

4.4.1 Internal Services Infrastructure

Access control will be provided to all office buildings with the provisions of electrical strike locks, proximity card readers and door alarms as determined during detailed design. The security system will have the capability for connection to a base monitoring location.

Closed circuit television (CCTV) system will be provided to each building to cover all building entry and exit points. A network video recorder will be provided for storage of captured CCTV footage for at least one month.

5 HYDRAULIC SERVICES

5.1 Sanitary Drainage

5.1.1 Utility Strategy

The Proposal's sewer is supplied from an internal connection to the MPE Stage 1 sewer infrastructure, which is anticipated to include a low pressure sewer connection that will have the capacity to provide for the sewer discharge for the whole MPE project.

5.1.2 Internal Infrastructure Strategy

The following allowances has been made for the site for the sanitary drainage requirements:

- Daily discharge from the amenities for approximately 1,408 people site wide.

The sanitary drainage system will be designed and installed in accordance with Australian Standard AS3500.2 Sanitary Plumbing and Drainage and the requirements of Sydney Water.

Sewage pump out pits will be provided individually for each warehouse. The pits will be located away from car parks for convenient access and maintenance.

The discharge from the individual pump outs will be connected to a single sewer rising main. The site sewer rising main will be extended to the MPE Stage 1 connection.

Refer to appendix A of this report for the layout of the proposed sanitary drainage of the Proposal.

5.2 Potable Water

5.2.1 Utility Strategy

The Proposal's potable water is supplied from an internal connection to the MPE Stage 1 potable water infrastructure, which is anticipated to include a potable water connection point with the capacity to provide potable water for the whole MPE project.

5.2.2 Internal Infrastructure Strategy

The following assumptions have been made for the Proposal's potable water requirements:

- Each office block will be provided with bathroom amenities and kitchenettes with the total site potable water demand of 15l/s.
- Additional flow rate allowance of 2l/s for technological process if required.
- 2l/s allowance have been made for irrigation and wash down. This requirement can be reduced by providing rainwater tanks which will be assessed during detailed design.
- Fire Hose Reels will be provided as required with minimum of 0.33L/sec flow at the two most disadvantaged fire hose reel(s).

The entire potable water demand provided above is a concept estimate only and is subject to further assessment during detailed design.

The potable water system will be designed and installed in accordance with Australian Standard AS3500.1 Water Supply and the requirements of Sydney Water.

Authority meter and potable water storage tank infrastructure will be provided in MPE Stage 1, and this will be sized according to the demands noted above and the availability of pressure and flow of the Sydney Water main.

A set of variable speed duty and stand-by pressurisation pumps will be assessed during the detailed design and if necessary installed adjacent to the tanks to improve the pressure in the potable water system.

Refer to appendix A of this report for the layout of the potable water services of the Proposal.

5.3 Fire Hydrant Service

5.3.1 Utility Strategy

The Proposal's fire hydrant water is supplied from an internal connection to the MPE Stage 1 fire hydrant water infrastructure, which is anticipated to include a connection point with the capacity to provide fire hydrant water for the whole MPE project.

5.3.2 Internal Infrastructure Strategy

The following assumptions have been made for the Proposal's fire hydrant system requirements:

- Full size storage tanks, pumps and a fire brigade booster will be provided in MPE Stage 1 to service MPE Stage 2. The size of the equipment will be reviewed during detailed design.
- Fire hydrant flow rate assumption was made for the maximum number of hydrant outlets to discharge simultaneously based on Table 3.3 of AS2419.1.

The fire hydrant system will be designed and installed in accordance with the NCC, Australian Standard AS2419, the requirements of NSW Fire Brigades, Sydney Water Corporation and local council regulations.

Fire Hydrant coverage will be provided throughout the buildings ensuring all areas can be adequately reached with a 60m hose length for external hydrant and 30m hose length for internal hydrant and 10m nozzle spray from a fire hydrant outlet.

Hydrant outlets will have a minimum of 5L/sec flow and 700kPa residual pressure at the most disadvantaged hydrant outlets, as required for a system utilising on-site booster pumps.

Refer to appendix A of this report for the layout of the proposed fire hydrant services the Proposal.

5.4 Natural Gas Service

Gas service will not be required due to no gas demand anticipated for the development at this stage.

5.5 Hydraulic Spatial Schedule

Table 11: Hydraulic spatial schedule

Description	Location	Installation	Comments
Fire Hydrants	MPE Stage 2. Site wide.	Will be provided during MPE Stage 2 works	Locations subject to further design
Warehouses sewer pump out pit	MPE Stage 2. Adjacent to each warehouse/ office	Will be provided during MPE Stage 2 works	Subject to further design of Stage 2

6 FIRE SERVICES

6.1 Fire Sprinkler Service

6.1.1 Utility Strategy

The Proposal's fire sprinkler services is supplied from an internal connection to the MPE Stage 1 fire sprinkler water infrastructure, which is anticipated to include a connection point with the capacity to provide fire sprinkler water for the whole MPE project.

6.1.2 Internal Infrastructure Strategy

The following assumptions have been made for the site fire sprinkler system requirements:

- Full size storage tanks, two diesel pumps and a fire brigade booster will be provided in MPE Stage 1 to service the Proposal. This capacity may be reduced during detailed design and subject to further information from authorities.
- A fire sprinkler system will provide fire sprinkler protection coverage throughout all warehouses and their respective offices and will be designed to the following hazard classification:
 - Administration areas -Light Hazard Class- LH
 - Plant areas (building services only) - Ordinary Hazard Class 1- OH1
 - Warehouses - High Hazard Category 4 with in-rack sprinklers.

Refer to appendix A of this report for the layout of the proposed fire service of the Proposal.

6.2 Fire detection and emergency warning systems

6.2.1 Internal Infrastructure Strategy

Fire detection will be provided throughout the buildings, with detectors selected to suit the specific hazard of each area to minimise the possibility of false alarms.

The fire detection and alarm system will be designed as an analogue addressable looped detection system, and will be connected to an approved monitoring company to notify the fire brigade in the event of a fire alarm.

An analogue addressable Fire Indicator Panel will be provided in the MPE Stage 1 Fire Control Room at ground level.

Sub - fire panels will be provided at each warehouse. A Fire Fan Control Panel (FFCP) will be provided adjacent to the Main Fire Panel and Secondary Fire Panel to allow manual operation of the Fire Fans by the brigade.

Interface will be provided with the following building services systems:

- Emergency warning system for controlled evacuation of building occupants
- Mechanical services system for operation in fire mode and system shut down upon fire alarm
- Combined sprinkler / hydrant system for monitoring of isolation valves, pumps, tanks, and system activation
- Security system for monitoring and release of locked doors in egress path

An emergency warning system will be provided throughout the warehouses to allow controlled evacuation of the building during a fire condition, including floor by floor cascading evacuation as determined through detailed fire safety engineering.

Occupant warning speakers will emit a pre-recorded verbal evacuation message and will be located to ensure the required speech intelligibility and sound pressure level can be delivered to all occupied areas.

An Emergency Control Panel will be provided adjacent to the Fire Panel.

Visual Alarms (Strobes) will be provided in areas with high ambient noise level, and to any areas specified for use by hearing impaired occupants.

Warden Intercom Phones (WIP) will be provided to allow direct communication with the fire warden, and Emergency Alarms (EA) will be provided adjacent to required exits.

6.3 Fire Spatial Schedule

Table 12: Fire spatial schedule

Description	Location	Installation	Comments
Alarm Valves enclosures	Vary. Refer to the concept drawing in Appendix A.	Within warehouses	Subject to further design

APPENDIX A

BUILDING SERVICES DRAWINGS

Drawing list:

SSS2-ARC-UT-SKC-0001 Electrical Services. High Voltage Electrical Strategy

SSS2-ARC-UT-SKC-0002 Electrical Services. Low Voltage Electrical Strategy







SSS2-ARC-UT-SKC-0004 Electrical Services. Communications and Security

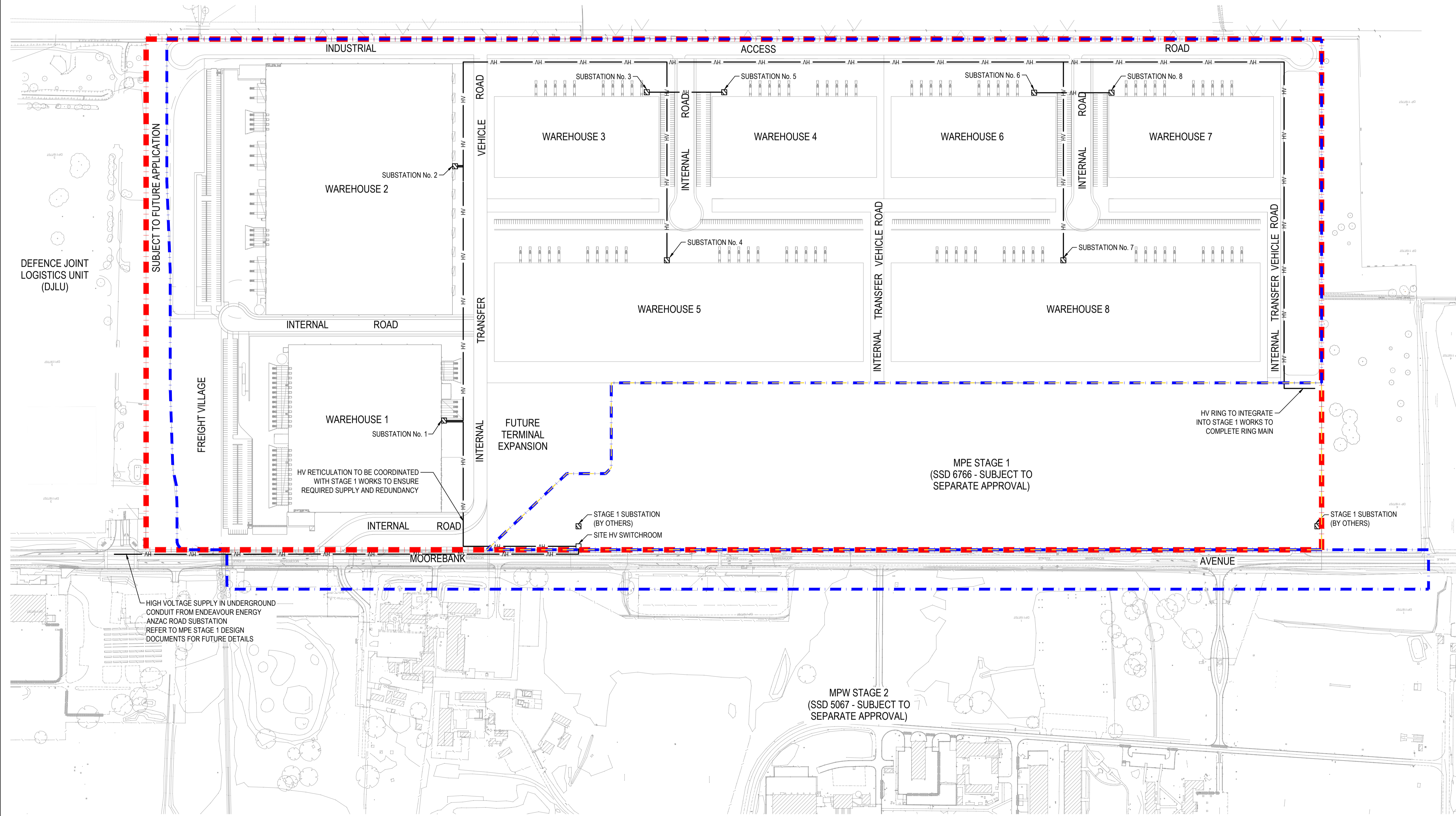
SSS2-ARC-UT-SKC-0005 Hydraulic Services. Domestic Water Layout

SSS2-ARC-UT-SKC-0006 Hydraulic Services. Sanitary Layout

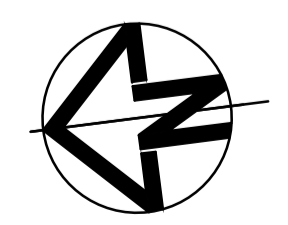
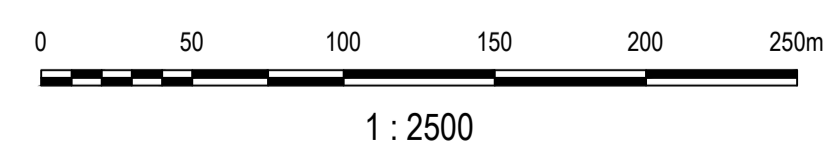
SSS2-ARC-UT-SKC-0007 Fire Services. Sprinkler Layout

LEGEND

-  PROPOSED SUBSTATION SPACE ALLOWANCE 6m x 6m
-  PROPOSED HIGH VOLTAGE CABLE ROUTE
-  SWITCHROOM
-  MPE SITE BOUNDARY
-  MPE STAGE 2 OPERATIONAL BOUNDARY
-  MPE STAGE 1 OPERATIONAL BOUNDARY



Issue	Description	Date
01	ISSUE FOR INFORMATION	12.10.16




Client




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Grid		Checked	G. IVES
		Approved	M. KEFFORD
Filename: SSS2-ARC-EL-SKC-0001-HighVoltageElectricalStrategy.dwg			

Project	MPE STAGE 2
Title	ELECTRICAL SERVICES HIGH VOLTAGE ELECTRICAL STRATEGY










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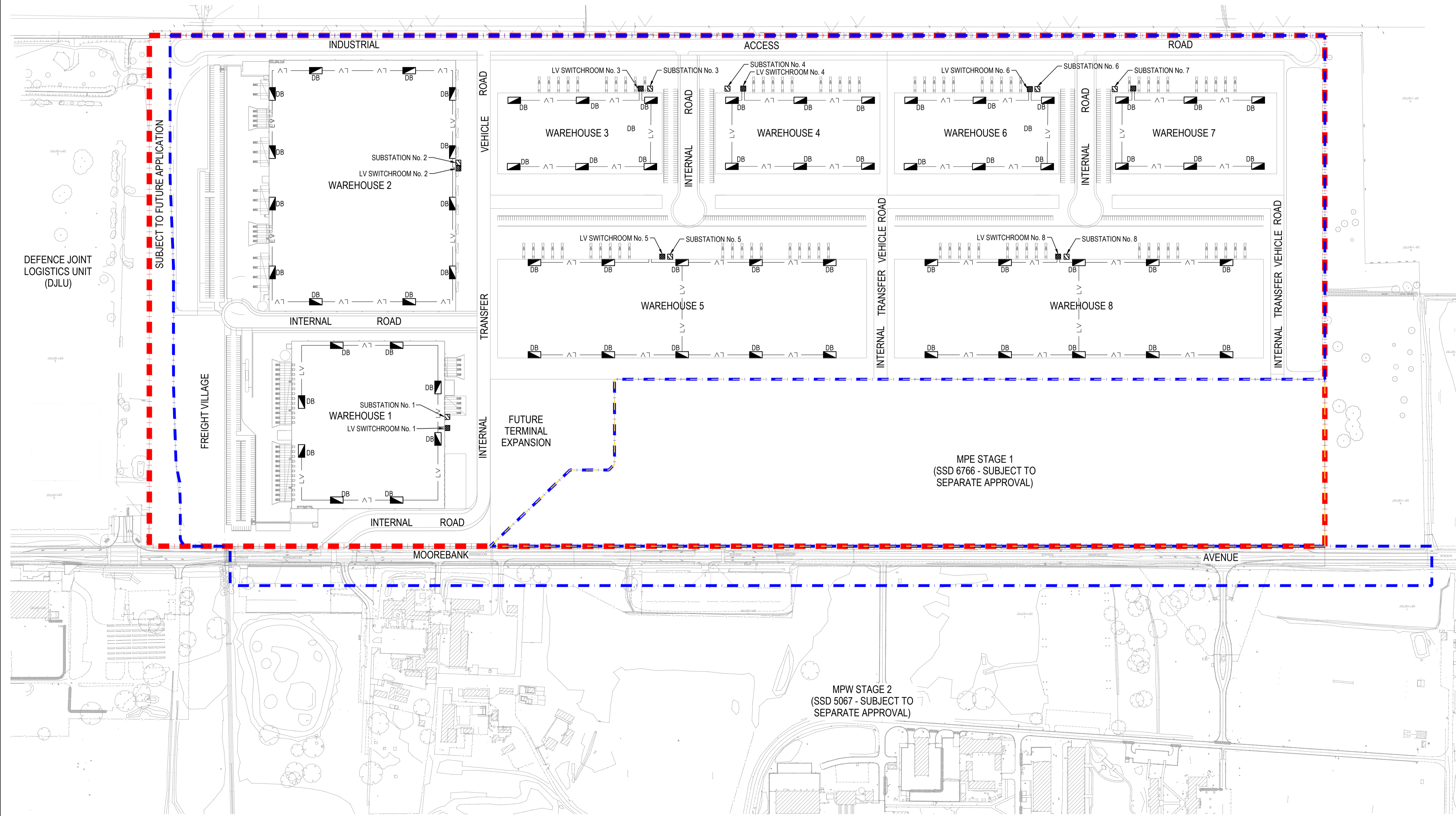
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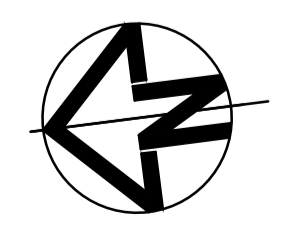
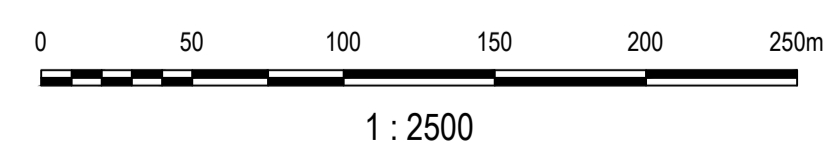
Issue

LEGEND

-  DISTRIBUTION BOARD
-  PROPOSED SUBSTATION SPACE ALLOWANCE 6m x 6m
-  PROPOSED LV SWITCHROOM SPACE ALLOWANCE 10m x 6m
-  LV LOW VOLTAGE DISTRIBUTION LINE
-  MPE SITE BOUNDARY
-  MPE STAGE 2 OPERATIONAL BOUNDARY
-  MPE STAGE 1 OPERATIONAL BOUNDARY



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		Approved	M. KEFFORD
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Project	MPE STAGE 2
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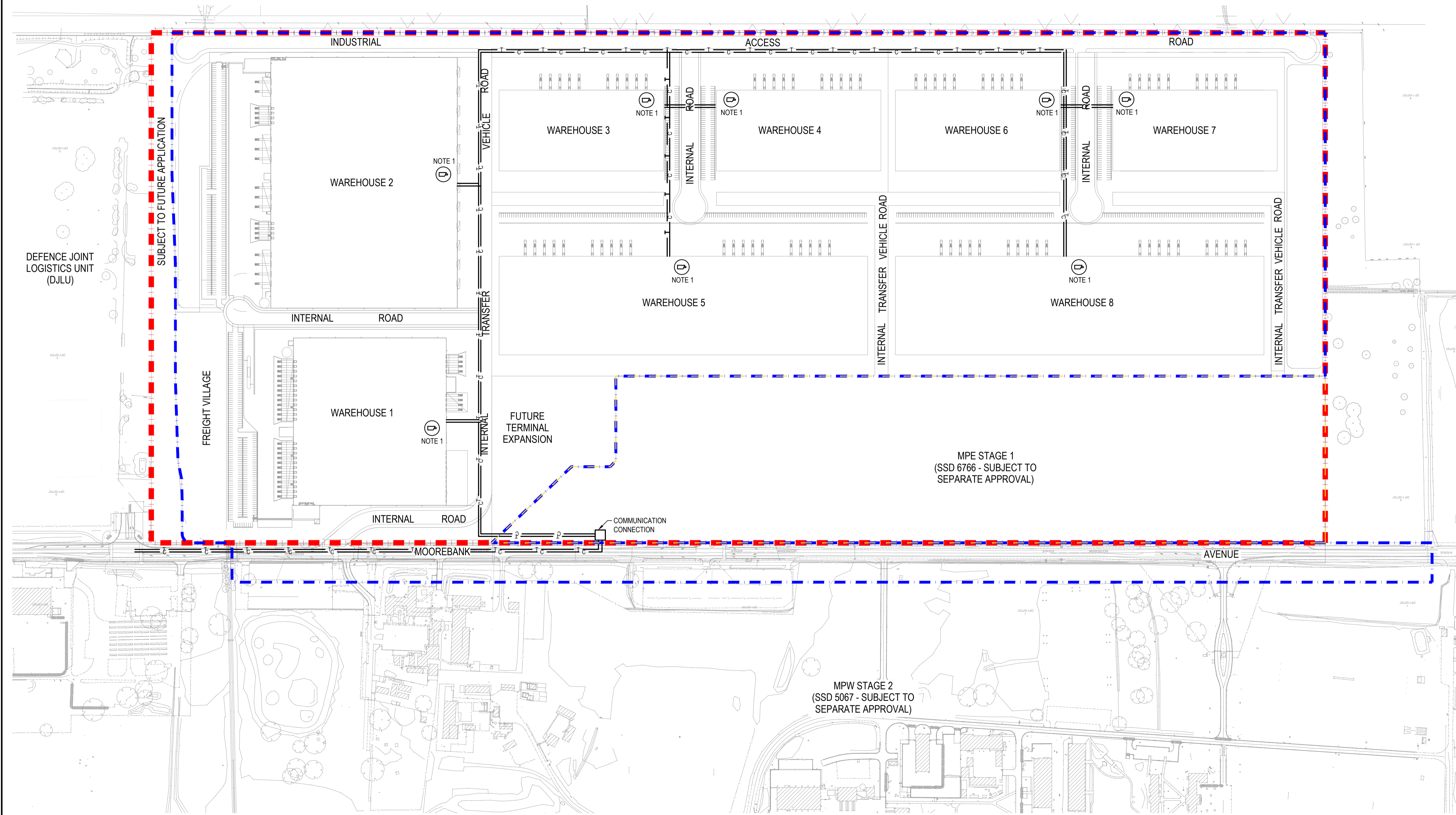
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LEGEND

- C — PROPOSED PRIVATE COMMUNICATIONS CONDUIT BACKBONE: 2x Ø 100mm
- T — PROPOSED TELSTRA COMMUNICATIONS CONDUIT BACKBONE: 4x Ø 100mm BRANCH OFF TO BUILDING: 2x Ø 100mm
- COMMUNICATION CONNECTION
- ⊕ AREA TO BE COVERED BY CCTV CAMERA
- ▬ MPE SITE BOUNDARY
- ▬ MPE STAGE 2 OPERATIONAL BOUNDARY
- ▬ MPE STAGE 1 OPERATIONAL BOUNDARY

NOTES

1. TO COVER ALL BUILDING ENTRY/EXIT POINTS, INTERNAL SPACE, CARPARK.
2. COMMUNICATIONS RETICULATION TO BE COORDINATED WITH STAGE 1 WORKS



Issue	Description	Date
01	ISSUE FOR INFORMATION	12.10.16

1 : 2500

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Checked	G. IVES
Approved	M. KEFFORD

Project

MPE STAGE 2

**ELECTRICAL SERVICES
COMMUNICATIONS
AND SECURITY**

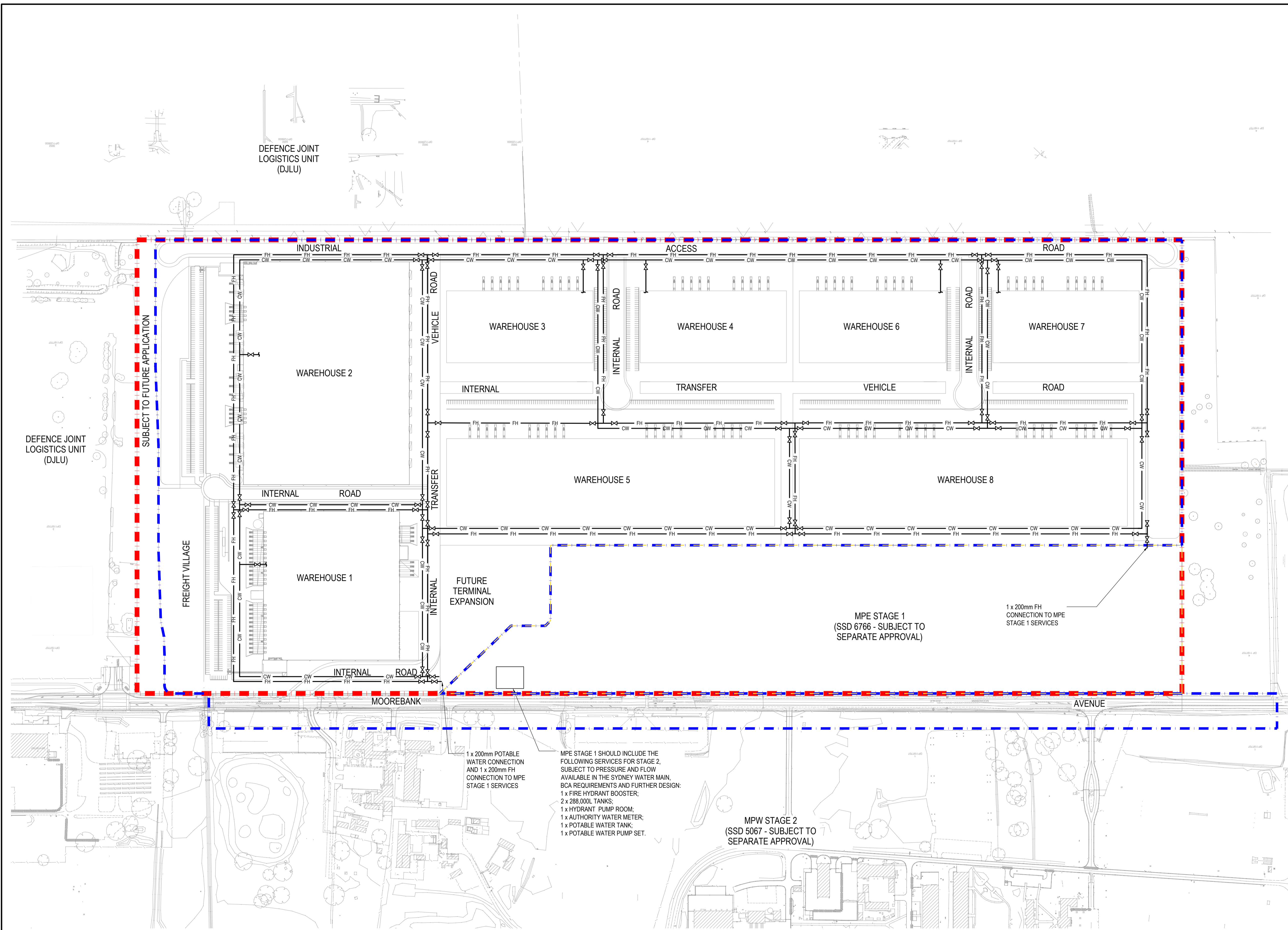
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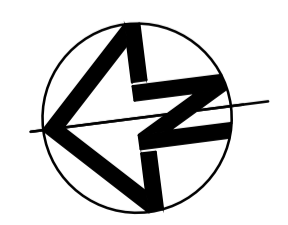
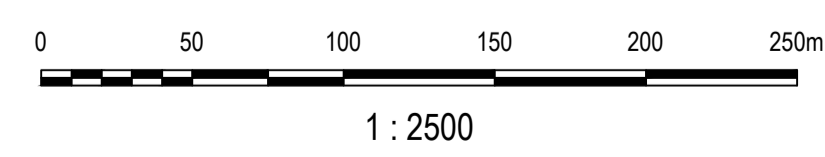
Drawing No. Issue
SSS2 -ARC-EL- SKC - 0004- 01

LEGEND

	CW	PROPOSED COLD WATER
	FH	FIRE HYDRANT SERVICES
		ISOLATION VALVE
		MPE SITE BOUNDARY
		MPE STAGE 2 OPERATIONAL BOUNDARY
		MPE STAGE 1 OPERATIONAL BOUNDARY



Issue	Description	Date
01	ISSUE FOR INFORMATION	12.06.16



Client

Status: **FOR INFORMATION NOT TO BE USED FOR CONSTRUCTION**

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File name:	SSS2-ARC-HY-SKC-0005-DomesticWaterLayout.dwg

Project: **MPE STAGE 2**

Title: **HYDRAULIC SERVICES DOMESTIC WATER LAYOUT**





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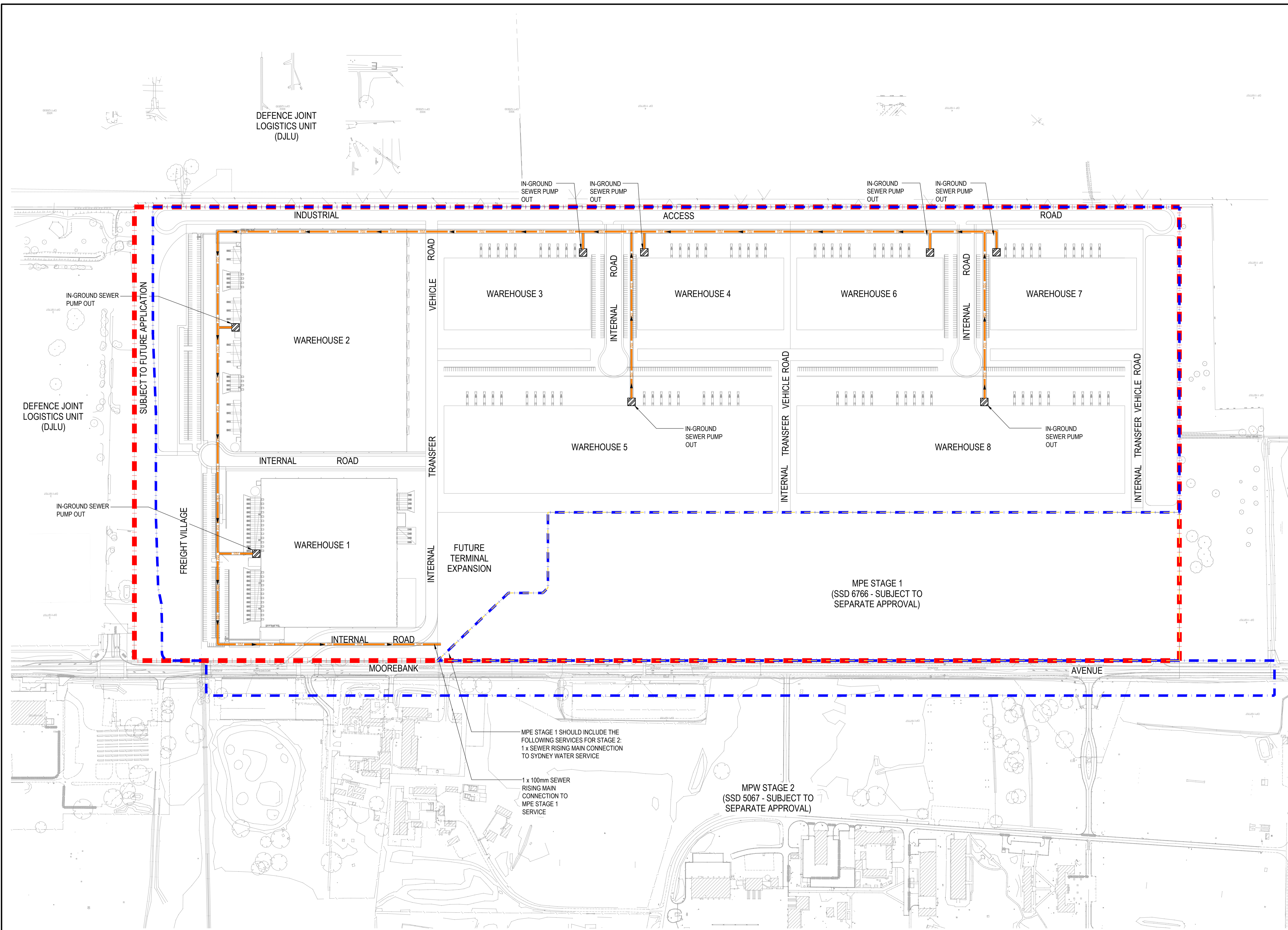
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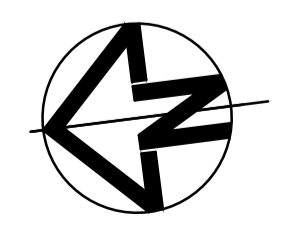
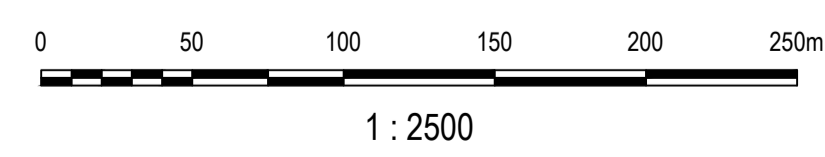
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LEGEND

-  RM SEWER RISING MAIN
-  MPE SITE BOUNDARY
-  MPE STAGE 2 OPERATIONAL BOUNDARY
-  MPE STAGE 1 OPERATIONAL BOUNDARY



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Filename:	SSS2-ARC-HY-SKC-0006-SanitaryLayout.dwg		
Approved	M. KEFFORD		

Project	MPE STAGE 2
Title	HYDRAULIC SERVICES SANITARY LAYOUT



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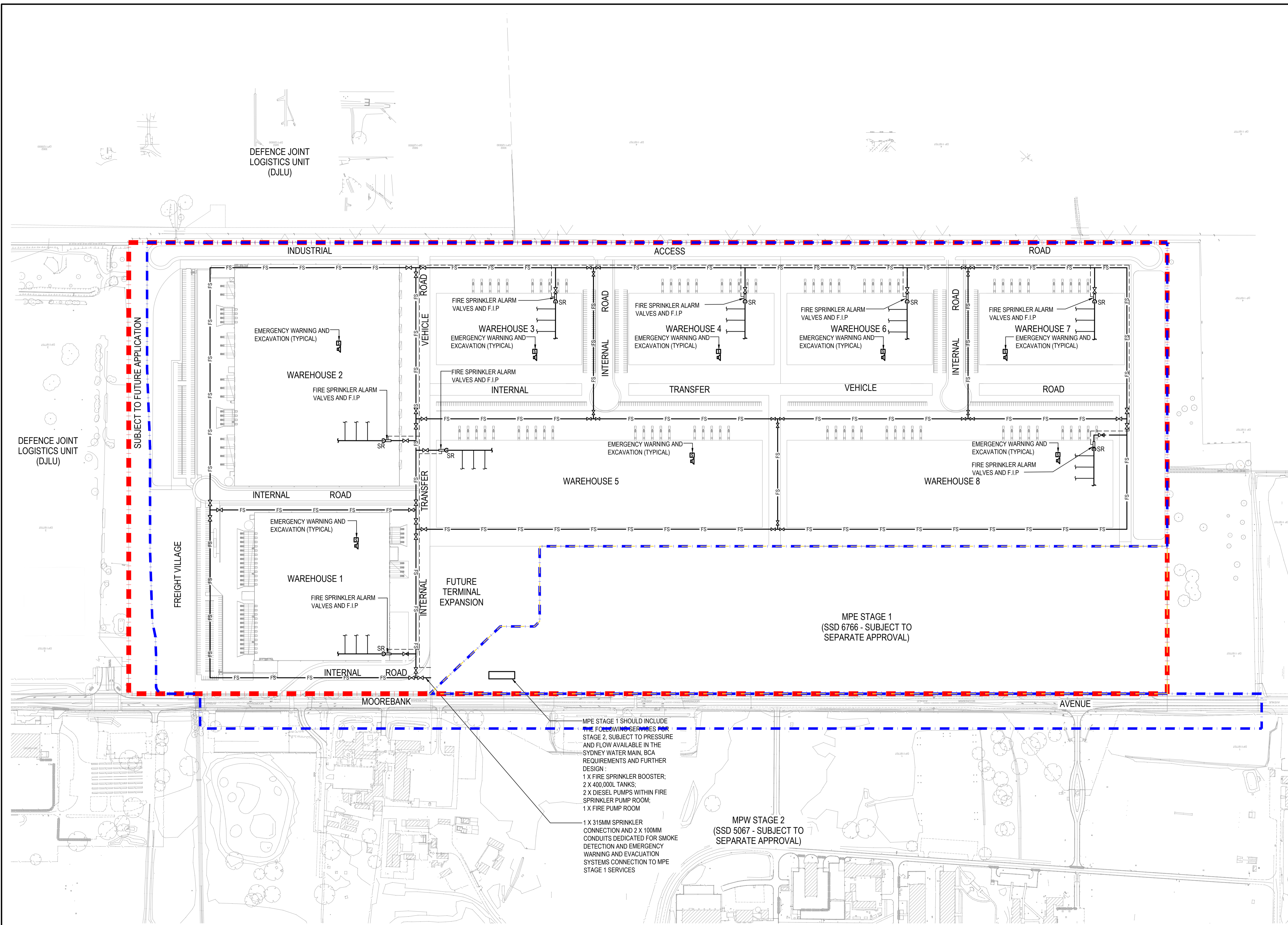
Project No. AA009335

Drawing No. SSS2-ARC-HY-SKC-0006-01

Issue

LEGEND

-  IN-GROUND 2 X Ø50MM CONDUIT DEDICATED FOR SMOKE DETECTION AND EMERGENCY WARNING AND EVACUATION SYSTEMS
-  IN-GROUND FIRE SPRINKLER
-  EMERGENCY WARNING BELOW CEILING SPEAKER/ALARM SOUNDER
-  SMOKE DETECTOR
-  ISOLATION VALVE
-  SPRINKLER RISE
-  MPE SITE BOUNDARY
-  MPE STAGE 2 OPERATIONAL BOUNDARY
-  MPE STAGE 1 OPERATIONAL BOUNDARY



MPE STAGE 1 SHOULD INCLUDE THE FOLLOWING SERVICES FOR STAGE 2, SUBJECT TO PRESSURE AND FLOW AVAILABLE IN THE SYDNEY WATER MAIN, BCA REQUIREMENTS AND FURTHER DESIGN:

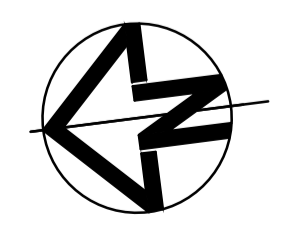
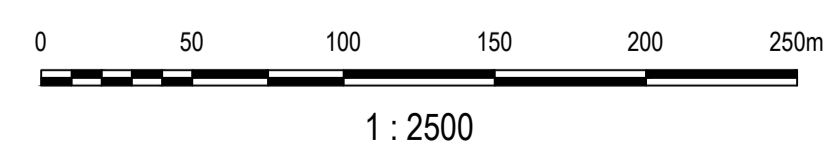
- 1 X FIRE SPRINKLER BOOSTER;
- 2 X 400,000L TANKS;
- 2 X DIESEL PUMPS WITHIN FIRE SPRINKLER PUMP ROOM;
- 1 X FIRE PUMP ROOM

1 X 315MM SPRINKLER CONNECTION AND 2 X 100MM CONDUITS DEDICATED FOR SMOKE DETECTION AND EMERGENCY WARNING AND EVACUATION SYSTEMS CONNECTION TO MPE STAGE 1 SERVICES

MPW STAGE 2 (SSD 5067 - SUBJECT TO SEPARATE APPROVAL)

MPE STAGE 1 (SSD 6766 - SUBJECT TO SEPARATE APPROVAL)

Issue	Description	Date
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Grid		Checked	G. IVES
Filename:	SSS2-ARC-FR-SKC-0007-SiteLayout.dwg		

Project	MPE STAGE 2
Title	FIRE SERVICES SPRINKLER LAYOUT



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Project No.
AA009335

Drawing No.
SSS2-ARC-FR-SKC-0007- 01

Issue