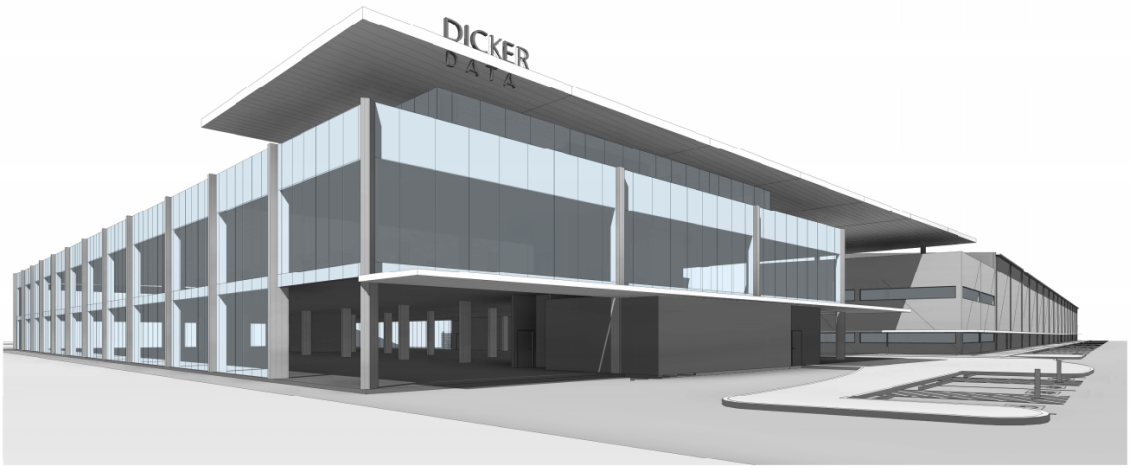
DCI

DICKER DATA WAREHOUSE, 238 - 258 CAPTAIN COOK DRIVE, KURNELL

BUILDING SERVICES RETURN BRIEF REPORT

MAY 2018

CONFIDENTIAL



DICKER DATA WAREHOUSE, 238 - 258 CAPTAIN COOK DRIVE, KURNELL

BUILDING SERVICES RETURN BRIEF REPORT

DCI

WSP
LEVEL 27, 680 GEORGE STREET
SYDNEY NSW 2000
GPO BOX 5394
SYDNEY NSW 2001

TEL: +61 2 9272 5100
FAX: +61 2 9272 5101
WSP.COM

REV	DATE	DETAILS
A	04/05/2018	Updated design team reporting references as per DCI request. Updated references to recently issued WSP consultant's advice documents.

	NAME	DATE	SIGNATURE
Prepared by:	MD, AK, BG, MR	04/05/2018	-
Reviewed by:	RXC	04/05/2018	
Approved by:	RAB	04/05/2018	

CONFIDENTIAL
OUR REF: PS106553 SERVICES RETURN BRIEF_REV03
MAY 2018

TABLE OF CONTENTS

1 INTRODUCTION

1.1 Preamble

WSP has been engaged by DCI to provide the following services for the proposed Dicker Data fitout:

- Mechanical;
- Electrical;
- Fire protection; and
- Vertical transportation.

The project is located at 238 – 258 Captain Cook Drive, Kurnell in Sydney and consists of:

- Approximately 7,000m2 of office to meet the Property Council of Australia (PCA) Grade A requirements, where applicable / possible;
- Approximately 40,000m2 of warehouse.
- Numerous service areas within the warehouse used for the purposes of assembling equipment.
- A commercial kitchen forming part of an in-house café. We understand that the café space will be utilised as town hall mode / function mode infrequently and sporadically throughout the year. We understand during these times, there will be increased occupancy density within the café area.

Our understanding that a separate base building contractor and fitout contractor will be engaged for the proposed development. The base building contractors will tender based on the WSP tender set (under design and construct contract) and the fitout contractors will tender based on a tender set by others. We understand that the entire warehouse package of works will fall under the base building tender set (unless otherwise noted throughout this report); and that the office package of works will be split between base building and fitout tender sets. Our understanding of the delineation between base building and fitout packages is further detailed within Section 6 of this report.

1.2 Aim

The aim of this report is to confirm WSP's understanding of the design criteria, services design scope and proposed system descriptions of the abovementioned building services for the proposed Dicker Data development.

WSP seek feedback from DCI on these items prior to commencement of design development.

1.3 Limitations

1.3.1 Sources of information

The following sources of information that have been reviewed and form the basis for this report include:

- WSP's approved fee proposal;
- Design team meetings held to date;
- Preliminary base building architectural drawings by WMK issued to date;
- Preliminary fitout architectural drawings by Futurespace issued to date;
- Correspondence between WSP and DCI, WMK and Futurespace.
- BCA Design Compliance Report dated 3 May 2018 by Modern Building Certifiers.
- PCA Guide to Office Building Quality 2012 'new building' requirements. A summary of the requirements met by our proposed services concept design is provided in Section 8 of this report. A revision of this document is due for release in 2018. As the current project programme includes for development application submission in January 2018 and as the new guide is expected to be applicable for projects with development application after 1 July 2018, we

understand the new guide will not be applicable. Furthermore, the requirements of the new guide have yet to be confirmed and made available to the market.

- National Construction Code (NCC) 2016. A revision of this document is due for release in 2019. Our understanding is that should construction certificate fall after 1 May 2019, NCC 2019 may be applicable to this project. As the requirements of NCC 2019 have yet to be confirmed and made available to the market, WSP are unable to ascertain whether there are any significant services implications.
- Responses to our 'request for information' (RFI) list issued to date. A current and complete list of RFI's (including those which have been previously closed out) is provided in Section 9 of this report.
- WSP 'ESD Concept Design Report' dated 10th November 2017.
- Our understanding that the project will not require an interim occupation certification after completion of base building construction.
- Written confirmation of fire protection scope of works received from DCI.
- Direction from meetings with DCI to investigate electrical standby power generation within concept design.

No formal written advice from the following parties have been received to date, for WSP review:

- Fire engineer;
- Audio visual consultant;
- Commercial kitchen consultant; and
- Warehouse logistics, racking and equipment manufacturers.

2 MECHANICAL SERVICES

This section of this report confirms WSP's understanding of the mechanical services design criteria, design scope and proposed system descriptions for the proposed Dicker Data development.

2.1 Design Criteria

2.1.1 External Design Conditions

	°C dry bulb	°C wet bulb
Summer	32.8°C	22.6°C
Winter	6.0°C	NA

External design conditions have been taken from AIRAH Handbook 2007.

2.1.2 Internal Design Conditions

2.1.2.1 Office

	°C dry bulb	% RH
Summer	22.5 +/- 1.5°C	-
Winter	22.5 +/- 1.5°C	-
Communication Rooms	24 +/- 1.0°C	-

No active humidity control provided. De-humidification is provided by virtue of the cooling process.

2.1.2.2 Warehouse

	°C dry bulb	% RH
Summer	22.5 +/- 1.5°C	-
Winter	22.5 +/- 1.5°C	-
Communication Rooms	24 +/- 1.0°C	-

No active humidity control provided. De-humidification is provided by virtue of the cooling process.

WSP understand the service areas within the warehouse are to meet the abovementioned internal design conditions; and that the general warehouse area is to be unconditioned. Any open areas within the warehouse which utilise spot cooling and heating will not meet the abovementioned internal design conditions.

2.1.3 Ventilation

All spaces are to be mechanically ventilated as required, in accordance with the minimum code requirements stated within NCC 2016 and AS 1668.2 (2012). An increase in minimum ventilation rates as outlined within the current sustainability strategy will be explored during the schematic design and design development phases of this project.

For town hall mode / function mode within the café, a natural ventilation strategy will be utilised.

2.1.4 Infiltration

The following infiltration rates will be utilised:

- 0 air changes per hour (ACH) for all centre zones of the office.
- 0.25 ACH for all perimeter areas of the office.
- 1.0 ACH for the café and other spaces with operable windows and/or doors which are expected to be utilised regularly.

2.1.5 Internal Heat Gains

	Gain (W/m²)	Diversity
Lighting	9 W/m² (as per NCC 2016 maximum illuminance levels)	None
Small power / equipment	General 12 W/m², in line with the Property Council of Australia Guide to Office Building Quality 2012. Meeting rooms - one laptop per two people; an allowance of 500W and 1000W of AV equipment to medium to large meetings rooms (in the absence of AV fitout information)	None
Occupancy	**Normal operation** The higher of the Property Council of Australia Guide to Office Building Quality 2016 occupancy density of 1 person per 10m2; and the number of people as documented on the fitout layouts, including seats to breakout areas. 70W/person (sensible) 60W/person (latent) **Town hall mode** 150 people. 70W/person (sensible) 60W/person (latent)	None
Food (café only)	1 hot meal per person. 15W/hot meal (sensible) 25W/hot meal (latent)	None
Kitchen	To be provided by fitout kitchen consultant.	As per ASHRAE Fundamentals 2013.

2.1.6 Codes and Standards

The concept design for the proposed Dicker Data development will allow for a design in line with the following codes and standards:

- National Construction Code (NCC) 2016. A revision of this document is due for release in 2019. Our understanding is that should construction certificate fall after 1 May 2019, NCC 2019 may be applicable to this project. As the requirements of NCC 2019 have yet to be confirmed and made available to the market, WSP are unable to ascertain whether there are any significant services implications.
- Relevant Occupation / Workplace Health and Safety Legislation
- Australian Standards AS 1668.1 - The use of ventilation and air conditioning in buildings - Fire and smoke control in buildings
- Australian Standards AS 1668.2 - The use of ventilation and air conditioning in buildings - Mechanical ventilation in buildings
- Property Council of Australia Guide to Office Building Quality 2016, where applicable.

2.2 Services Design Scope

The mechanical services design scope will include the following systems:

- Air conditioning systems
- Outside air systems
- Toilet exhaust air systems
- General exhaust air systems
- Commercial kitchen exhaust air system
- Smoke exhaust systems, where applicable
- Controls

2.3 System Descriptions

2.3.1 Air Conditioning Systems

2.3.1.1 Office

The office space will be air conditioned (space cooling and heating) throughout. Due to the development comprising of a single tenant commercial office space with an integrated fitout arrangement, WSP propose use a single combined base building and tenant system.

Separate packaged units to be provided for separate open plan office zones including separate perimeter/centre zones. Separate packaged units are to be provided for large meeting / training rooms and the level 02 CEO office.

The air conditioning system to be utilised will be in line with the air cooled packaged unit solution and variable air volume system proposal as detailed within the WSP consultant's advice, CA-M-01 dated 13th November 2017. Temperature control will be adjustable via the BMCS only i.e. not adjustable locally by occupants.

2.3.1.2 Cafe

A separate packaged unit is to be provided for the air conditioning to the café. The air conditioning system to be utilised will be in line with the air cooled packaged unit solution and variable air volume system proposal as detailed within the WSP consultant's advice, CA-M-01 dated 13th November 2017. Temperature control will be adjustable via the BMCS only i.e. not adjustable locally by occupants.

During town hall mode / function mode of the cafe, we understand it is proposed for high occupancy figures within this space. The air cooled packaged unit is intended to provide space cooling and heating to this space during normal café mode; and capable of providing space cooling and heating to this space during function / town hall mode.

Should the doors be opened for natural ventilation purposes, the air conditioning system may not be able to meet design conditions.

2.3.1.3 Warehouse

Air conditioning will be provided to the service areas within the warehouse space. The air conditioning system to be utilised will be in line with the air cooled packaged unit solution and variable air volume system proposal as detailed within the WSP consultant's advice, CA-M-01 dated 13th November 2017. Temperature control will be adjustable via the BMCS only i.e. not adjustable locally by occupants.

In general, no air conditioning (space cooling or space heating) systems will be provided to the general warehouse area. Spot cooling and heating has been investigated as presented within WSP's consultant's advice CA-M-03 dated 26th March 2018, for the dispatch areas of the warehouse. Implementation of spot cooling and heating will be subject to feedback from DCI / Dicker Data.

2.3.2 Outside Air Systems

2.3.2.1 Office

The office space will be mechanically ventilated throughout via the central air conditioning systems. Demand control ventilation (carbon dioxide, CO_2 control) will be provided to spaces with high occupancy including the larger training rooms and café, where possible. The purpose of this control strategy is to only provide outside air to spaces with high design occupancies, only as required; with the expectation of energy efficiency benefits.

The inclusion of an outside air system to meet the PCA requirement to allow for future system flexibility will be explored during design development.

2.3.2.2 Café

For normal mode of the café, outside air will be provided to the café as per Section 2.3.2.1.

For town hall mode / function mode within the café, a natural ventilation strategy will be utilised. This strategy will include:

- Ventilation to be provided via operable doors / windows to the café to meet minimum code requirements.
- Outside air to meet the increased occupancy within town hall mode / function mode is not mechanically provided. Should outside air be mechanically provided to this space to cater for the increased occupancy within town hall mode / function mode, additional roof top plant is expected to be required. Based on WSP's understanding of the infrequent and sporadic use of this space in town hall mode / function mode, the additional plant was understood to be an unviable solution.

2.3.2.3 Warehouse

The services areas to the warehouse space will be mechanically ventilated throughout via the central air conditioning systems.

The general warehouse space is to be naturally ventilated in accordance with the requirements of NCC 2016. Assisted natural ventilation options have been explored to assist with air movement and perceived thermal comfort throughout the warehouse space. Our findings have been presented within CA-M-02 dated 6th April 2018 with the final solution to be implemented subject to feedback from DCI / Dicker Data.

2.3.3 Toilet Exhaust Air Systems

Toilet exhaust air systems will be provided to all toilets.

2.3.4 General Exhaust Air Systems

A general exhaust system is to be provided to the project, as required to meet minimum code requirements. The option of extending this system throughout the office building to allow for future expansion and connection will be explored during design development.

2.3.5 Commercial Kitchen Exhaust Air System

2.3.5.1 Office

Not applicable

2.3.5.2 Cafe

A commercial kitchen exhaust system as defined by NCC 2016 and AS1668.2 (2012) will be provided, available for future connection to serve the proposed commercial kitchen within the office café. A system allowing 3,000L/s of exhaust air is to be provided.

2.3.5.3 Warehouse

Not applicable.

2.3.6 Smoke Exhaust Systems

2.3.6.1 Office

The office space will utilise a smoke exhaust system subject to the requirements of the NCC 2016 and any alternative solutions by the fire engineer. The return air systems forming part of the air conditioning systems will be utilised as a smoke exhaust path.

2.3.6.2 Warehouse

The warehouse space will utilise a smoke exhaust system subject to the requirements of the NCC 2016 and any alternative solutions by the fire engineer.

2.3.7 Controls

A new Building Management and Control System (BMCS) will be provided, complete with head end. The BMCS functionality will include:

As a minimum the following new equipment will be monitored and/or controlled via the BMCS:

- Monitoring and control of mechanical services equipment including packaged units and fans throughout.
- Energy management via metering;
- Emergency lighting; and
- Fire indicator panel.

The BMCS will be utilised to activate after hours operation.

The BMCS will incorporate functionality to send alarm signals/alerts to nominated personnel by email.

3 ELECTRICAL SERVICES

This section of this report confirms WSP's understanding of the electrical services design criteria, design scope and proposed system descriptions for the proposed Dicker Data development.

3.1 Design Criteria

ITEM	DESIGN CRITERIA
Electrical maximum demand	→ As per AS3000. → Preliminary allowance from the following major loads: — Office General Lighting and Power - 50 VA /m^2 — Office Mechanical Services – 35 VA /m^2 — Warehouse General Lighting and Power – 10 VA /m^2 — Warehouse Mechanical Services – 5 VA /m^2 → Refer to Appendix A for further details and diversities applied.
Main Switchboards	→ Two Main Switchboards, one for each transformer. One switchboard will serve office building the other will serve the warehouse building. → Ventilated internal switch room → Main busbar and switch to substation rating → Air circuit breakers 1600 A and above → Moulded case breakers less than 1600 A → Fault level to match incoming supply and to local network providers requirements. → Top / Bottom entry → Top exit → Free-standing → Front access only → Max. demand > 1600A Form 4 → Max. demand < 1600A Form 3B → Digital multifunction meter on each section
Consumer mains	→ As per code requirements → Max. Demand + 25%, or capacity of substation if sole user (to be confirmed by ASP Level 3 Engineer).
Supply Authority Metering	→ One supply authority meter for each Main Switchboard.
Distribution boards	→ Moulded case breakers > 100 A → Miniature circuit breakers ≤ 100 A → Final sub-circuit Protection Circuit breakers Min 10kA fault level. → General distribution boards 25% spare pole space → Office distribution boards (pole capacity TBC)

ITEM	DESIGN CRITERIA
	→ Individual RCD protected circuits to code requirements
Submains	→ Capacity Max. Demand + 20% → XLPE / PVC copper type generally → Life safety services Radox FR, Firestop. → 1 x 4 core less than 125 A. → 4 x 1 core greater than 125A → Cable tray support for all submains reticulation
General Energy Metering	→ Energy Monitoring System → Each Section of the Main Switchboards → Distribution boards (separate metering for lighting and power circuits) → Mechanical service distribution boards → Lifts → Major electrical equipment loads
Power Factor Correction	→ Spatial provision for future power factor correction equipment.
Standby Generator	→ No permanent standby generator facilities have been allowed for. → Dicker Data to confirm if connection points are required at the Main Switchboards for the connection of temporary generator sets.
Uninterruptable Power Supply (UPS)	→ No Uninterruptable Power Supply system will be provided as part of the these works future provision by others.
Cable Containment	→ Cable trays, conduit and catenaries located in ceiling spaces or along warehouse trusses / beams.
Communication Lead-In Provisions	→ 2 x 100mm diameter lead-in conduits from street to main communications room/ communications riser. → Lead-in cabling to be arranged by Dicker Data.
Final sub circuits	→ 20A minimum rating → Power 2.5mm2 V75 min. → Lighting 2.5mm2 V75 min → Larger cables will be used where required due to long cable runs / lengths → Max 60% utilisation of AS/NZS 3000 → Cable tray, conduit and catenary wires for support of sub-circuit cables
Voltage drop	→ Consumer mains < 1% volt drop → Submains approx. 2.5% volt drop → Final sub-circuits, 3.5% volt drop
Power outlets	→ General purpose outlets and outlets for cleaning purposes. → Hardwired power outlets to suit specialist equipment such as forklift chargers nominated by Dicker Data.

ITEM	DESIGN CRITERIA
	→ Hard wired outlets / isolators for other service discipline equipment where required.
Lighting	→ Illumination levels as per AS1680 and AS1158.3 → Generally LED lamp type luminaires → Cool white (4000K) colour temperature. Colour temperature of any feature lights will be coordinated with the architect.
Lighting Control	→ DALI lighting control system consisting of motion sensors, daylight sensors, time clocks and light switch panels. Refer to the lighting control section of this return brief for further details.
Emergency Lighting & Exit Signs	→ As per AS2293 and the NCC → Semi-recessed LED 'edge lit' type exit signs and recessed LED 'spitfire' type emergency lights in office areas. → LED batten type emergency lights and surface mounted exit signs in plant rooms. → The emergency light fittings will be integrated with the general lighting installation (the emergency lights will be the same as the general lights however they will be fitted with emergency battery packs). Final configuration to be confirmed pending lighting selection. → Extra-large exit signs will be used in the warehouse area with increased viewing distances → Wired or wireless computer monitored system, to be confirmed by Dicker Data
Master Aerial Television System	→ Roof mounted free-to-air digital antenna (including digital radio) and Foxtel compliant satellite dish. → TV services distributed in office building via RG6 coaxial cable → Requirements for TV services in warehouse are to be confirmed by Dicker Data
Public Address System	→ Requirements for a public-address system to be confirmed by Dicker Data.
Lightning Protection	→ As per code
Photo Voltaic (PV) System	→ Photo Voltaic (PV) system will be provided along the rooftop of the warehouse and office area of the building. → Further investigation will be required to determine the potential size of the PV system and to determine if any battery storage / exportation of energy back to the grid is required.
Earthing	→ As per code → Surge diversion at incoming supply

3.1.1 Codes and Standards

The design concept for the Dicker Data Warehouse will allow for a design in line with the following codes and standards:

- → NCC 2016
- → Relevant Occupation / Workplace Health and Safety Legislation
- → Service Rules and Regulations of the local Supply Authority

- AS/NZS 3000 Electrical installations (known as the Australian/New Zealand Wiring Rules)
- AS/NZS 3008.1 Electrical Installations - Selection of cables.ac
- AS/NZS 1680 Interior Lighting
- AS1158.3 Lighting for Roads and Public Spaces
- AS4282 Control of The Obtrusive Effects of Outdoor Lighting
- AS/NZS 2293 Emergency Evacuation Lighting.
- AS/NZS 3439 Low-voltage switchgear and control gear assemblies

3.2 Services Design Scope

Electrical services for the proposed Dicker Data development will include the following systems:

- Main Switchboards (MSB)
- Consumer Mains
- Supply Authority Metering
- Distribution Boards
- Submain Cabling
- General Energy Metering
- Cable Containment Systems
- Communications Lead-in (Containment System Only)
- Final Sub-Circuit Cabling
- General Power and Power to Other Services
- General Lighting and Lighting Control (Including External Lighting)
- Emergency Lighting and Exit Signs
- Master Aerial Television System
- Public Address System (if required)
- Lightning Protection System (if required)
- Photo Voltaic System
- Earthing
- Standby power generation

Note that the electrical substations will be provided under a separate ASP Level 3 scope by others; and security services by others.

3.3 System Descriptions

3.3.1 Electrical Substations

All works associated with the new substation design are to be completed by the ASP Level 3 design engineer. WSP will work with the ASP Level 3 design engineer to ensure that the site is provided with sufficient power and for the coordination of the substation connection to the Main Switchboards.

WSP have completed a preliminary maximum demand calculation for site based on AS3000 VA/m^2 rates and anticipate that the Stage 1 works will have an approximate electrical load of 995kVA and that the Stage 2 works will have an approximate electrical load of 405kVA (refer to Appendix A for preliminary electrical load assessment). Based on our preliminary electrical load assessment WSP understand that two kiosk substations will be required to cater for the total site electrical load. Note that the final loading is subject to confirmation of equipment loads.

Final configuration of the site substations to be advised by the ASPL3 design engineer.

3.3.2 Main Switchboards

Based on the preliminary electrical load assessment, WSP understand that two kiosk substations will be required to cater for the total site electrical load (stage 1 and stage 2 works). It follows that two Main Switchboards will be required for the site, one for each of the supplying substations.

One switchboard will be used to serve power to the office area and the second switchboard will be used to supply power to the warehouse area. It is desirable from a safety point of view to have each substation supplying physically separated areas of the site rather than having a common floor plates / areas served from two separate substation supplies. Although facilities should be provided to enable both MSB's to be supplied from a single substation to enable the supply to the site to be maintained if one of the substations is unavailable.

Should the kiosk substations be installed in a staged sequence, the electrical supply arrangement can be configured in a similar arrangement to that depicted in Appendix B.

The Main Switchboards will be positioned in a location agreed with the architect on ground floor level. There is a preference to have the Main Switch Room located near the new substations to reduce cable lengths and costs.

The main switchboards will be divided into separate sections for life safety services and general services. The main switchboards will also provide power to mechanical, hydraulic and fire services. Each section of the switchboard will be provided with a multi-function meter to display and record load information. Multi-function meters will also be installed as required by the NCC.

The main switchboards will be of Form 3B construction, floor-mounted, free-standing and in IP42 rated enclosures. The main switchboards cable entry and exit locations (e.g. bottom entry / top exit) will be confirmed during detailed design. Each main switchboard will be provided with an additional 20% spare capacity.

The main switchboards will be designed to enable the future stage 2 works to be implemented without the need to modify the switchboards.

3.3.3 Consumer Mains

Consumer mains cabling will connect the site Main Switchboards to the new site substations. Consumer mains cabling will be installed underground within conduits from the kiosk substation location to the main switch room.

3.3.4 Supply Authority Metering

The main supply authority meters will be located within the Main Switch Room, one for each kiosk substation electrical supply. The meters will be of Ausgrid type, as issued by them, accessible by Ausgrid personnel, and located in accordance with Ausgrid standards. Where required, the architect will be required to specify door locking hardware keyed to Ausgrid standard keying arrangements.

3.3.5 Distribution Boards

Distribution boards will be provided on ground level and level 1 of the office for the connection of all general power and lighting circuits (the level 2 office power and lighting will be supplied from the level 1 office distribution boards). General

lighting and power distribution boards will also be provided for the warehouse ground level 3PL area and level 1 service area. Each distribution board will have separately metered chassis for lighting and power circuits as required by the NCC,

Any additional distribution boards required for the fitout e.g. the café / kitchen, communications room etc. will be installed as part of the fitout scope of works.

Light and power distribution boards will also be provided to the warehouse area for general lighting and power circuits as well as external lighting and special equipment nominated by Dicker Data (e.g. forklift charging stations). Separate distribution boards may be provided for lighting and power circuits instead of combined lighting and power distribution boards to reduce construction costs. Final configuration to be confirmed during detailed design.

Distribution boards will typically be of the surface mounted front connected, DIN circuit breaker type. All distribution boards will be of Form 1 sheet metal construction, enclosed and complete with hinged, lockable doors. Circuit breakers will have a minimum rating of 10 kA with integral RCD protection for all lighting and general power sub-circuits. Warehouse distribution boards will be provided with sufficient pole space to meet the current building design plus an additional 25% spare space for future circuits. The pole capacity required for the office distribution boards will be confirmed as the fitout design progresses. The distribution boards will not be provided fully populated with circuit breakers, circuit breakers will only be installed as required to serve the initial building services installation.

Dedicated distribution boards / Control panels will be provided for mechanical, hydraulic and fire services where required. These distribution boards will be provided as part of their respective disciplines design package (submains by electrical contractor).

3.3.6 Submains Cabling

All sub-mains cabling will originate from the Main Switchboards and utilise copper conductors. Non-essential services will be XLPE/PVC type cabling. Essential services will be cabled in polymeric insulated fire rated copper cabling and be provided with additional mechanical protection as required by the NCC and AS/NZS. Sub-mains cabling will be designed to allow for an additional 20% capacity over the calculated maximum demand capacity.

Capacity will be provided to enable the future stage 2 works to be implemented.

3.3.7 General Energy Metering

Electrical meters will be provided for recording the energy consumption of the different equipment types installed as per the requirements of the NCC. All energy meters will be connected to the base building BMCS for monitoring and reporting purposes. Energy meters will be installed for the following specific equipment:

- Each Section of the Main Switchboards
- General distribution boards (separate metering for lighting and power circuits)
- Mechanical service distribution boards
- Lifts
- Major electrical equipment loads

Requirements for monitoring of water and gas usage to be confirmed by Dicker Data.

Any private meters required to monitor additional distribution boards / services will be installed as part of the fitout scope of works.

3.3.8 Power Factor Correction

Spatial provision for power factor correction equipment within the main switch room will be provided to facilitate future installation of power factor correction equipment.

3.3.9 Uninterruptable Power Supply (UPS)

No Uninterruptable Power Supply system will be provided as part of the base building works.

3.3.10 Cable Containment Systems

Sub-mains cabling will rise vertically through the office building and will generally be installed within a dedicated electrical riser cupboard located on every floor. The riser cupboards will be constructed of non-combustible material and will be smoke-sealed. Each riser cupboards will be suitably sized so that there is sufficient space to install both vertical submains cabling and the floor electrical distribution boards.

Horizontal reticulation of sub-mains within the warehouse and office buildings will be by means of cable trays, conduit and catenaries located in ceiling spaces or along warehouse trusses / beams.

3.3.11 Final Sub-Circuit Cabling

All sub-circuit cabling will be of minimum 2.5mm² V75 TPS type cabling. Power and lighting sub-circuits will be designed with a maximum circuit utilisation of 60%. External sub-circuit cabling will be of minimum 4mm² V75 TPS cabling.

Sub-circuits will be run within ceiling voids, along warehouse trusses / beams and in wall cavities where possible.

Horizontal and vertical reticulation of sub-circuits will be via cable tray, catenaries, or other suitable cable containment methods. Where cabling is required to reticulate within solid walls, cables will be chased / precast and installed within conduits.

3.3.12 General Power and Power to Other Services

Power outlets will be provided throughout the warehouse area and plant rooms for general use and cleaning purposes. Any specific equipment requiring power provisions such as forklift charging stations are to be nominated by Dicker Data.

Power outlets will be provided within the office area to serve base building services equipment only. WSP understand that any power outlets and skirting wiring duct required along the general office floor plates will be installed as part of the fitout works.

3.3.13 General Lighting and Lighting Control (Including External Lighting)

Energy efficient lights will be used to ensure general efficiency and low maintenance of the lighting installation. All internal lighting will be designed to meet the recommended lighting levels nominated in AS1680 and will generally be cool white colour temperature (4000K). External lighting will be designed in accordance with AS1158.3 and AS4282.

A smart lighting control system featuring motion sensors, daylight harvesting and time clocks will be installed to minimise energy wastage. The lighting control system will generally utilise the DALI protocol and will operate independently of the BMCS and security systems (Dicker Data to confirm).

The table below provides an overview of the light types and lighting control philosophy that will be used for the base building lighting installation. Further development of the lighting control philosophy may be required once the exact delineation of works between the base building design and the fitout design is agreed.

Area	Luminaire / Lighting Control Description
Warehouse	**Luminaires** → Further investigation will be required to determine the best lighting solution for the warehouse area. The lighting may comprise conventional high / low bay luminaires or a track lighting systems. Potential lamp technologies include

Area	Luminaire / Lighting Control Description
	fluorescent, high pressure sodium, metal halide, mercury vapour, LED, mercury vapour etc. → The exact colour temperature will be dependent on the lamp technology selected. Generally, WSP will aim to use 4000K colour temperature or a white light type. **Lighting Control** → Further investigation will be required to determine the best lighting control philosophy for the warehouse. Options include daylight harvesting along the roof skylights and motion sensor control. → Options for different lighting levels / dimming of warehouse lights when no occupancy is detected (instead of switching the lights completely off) to be discussed with Dicker Data.
Office lighting	→ WSP understand that all office lighting will be completed as part of the fitout scope of works.
Amenities, cleaner rooms and associated corridors.	**Luminaires** → Recessed LED downlights and troffers → LED pelmet lighting if required → 4000K colour temperature **Lighting Control** → There will be two standard modes of operation: business hours and afterhours mode. → Lights within the amenities and associated corridors will switch on / off via motion sensors. During business hours, the lights will switch on when moment is detected. The lights will dim to 20% after 30 minutes of no movement detection. During afterhours, the lights will switch on when moment is detected. The lights will turn off after 30 minutes of no movement detection. → Lights within the cleaner rooms will switch on / off via motion sensors.
Fire Stairs	**Luminaires** → Surface mounted LED batten type luminaires → 4000K colour temperature **Lighting Control** → Luminaires within the fire stairs will switch on / off via motion sensors. Lights will switch on to 100% output when motion is detected and then dim down to 20% (to be confirmed) when no motion is detected.
Plant Rooms / Office Garage	**Luminaires** → Surface mounted LED batten type luminaires → 4000K colour temperature **Lighting Control** → Luminaires installed in each plant rooms will be controlled via a local light switch.
External Lighting	**Luminaires** → LED Bollards / Pole mounted lights along walk ways

Area	Luminaire / Lighting Control Description
	→ LED pole mounted lights in the carpark area → Wall mounted LED lights → 4000K colour temperature → Final configuration to be co-ordinated with the landscape architect. **Lighting Control** → External lights will be switched on / off via photocells in nominated locations complete with a time schedule override. → Options for different lighting levels / dimming of external lights during early morning hours to be discussed with Dicker Data.

3.3.14 Emergency Lighting and Exit Signs

An emergency lighting system will be installed to meet the requirements of the NCC 2016 and AS2293. The system will be monitored to allow for automatic testing and reporting.

The emergency lights installed within building area that have a ceiling (such as the base building amenities) will be recessed non-maintained 'spitfire' type and exit signs will be maintained semi-recessed 'blade' type fixtures. Maintained LED batten type emergency light fittings and surface mounted maintained exit signs will be used in plant rooms and fire stairs.

The emergency lighting fixtures used in the warehouse area will be influenced by the type of general lighting installed. WSP anticipate that maintained type emergency light fittings will be integrated with the general lighting installation (the emergency lights will be the same as the general lights however they will be fitted with emergency battery packs). Final configuration to be confirmed.

All exit luminaries will use LED lamp technology and will comprise the "running man" style, green/white colour pictogram sized to suit viewing distances.

3.3.15 Master Aerial Television System

A free-to-air digital antenna (including digital radio) and Foxtel compliant satellite dish will be provided on the office building roof area for receipt of TV services. The TV services will be distributed to each level of the office building using RG6 coaxial cabling. A 6-way splitter will be provided on each floor within the communications riser. Any field outlets required within the office floor plate area or additional splitters / amplifiers required will be provided as part of the electrical services fitout design.

Requirements for the distribution of TV services within the warehouse areas are to be confirmed by Dicker Data.

Service agreements with Foxtel will need to be arranged by Dicker Data.

3.3.16 Public Address System (If Required)

Requirements for a public-address system are to be confirmed by Dicker Data.

3.3.17 Lightning Protection System (If Required)

A risk assessment will be conducted based on the relevant standards to determine if a lightning protection system is recommended. The system (if required) will comprise:

- → Air terminations on the roof, mast extension, stay cables.
- → Down conductors will be electrically isolated from the building structure using dedicated insulated down conductors.

- Earthing of down conductors will be achieved by earthing pits and earth electrodes in accordance with manufacturer's recommendations. Pits will incorporate event counters.
- Façade earthing.

The lightning protection system will not be of the ionization and radioactive type.

The lighting protection system will be based on the Faraday cage principle, complete with air terminations, down conductors and an earth electrode system. Steel columns where available will be used as down conductors whenever practical. Where a conventional steel reinforced concrete structure is used, steel reinforcing may be used as the down conductor provided proper bonding between steel rods is used.

Earthing electrodes will be used to supplement the above, or used where connection to structure is not practical. Test points for checking the installation earth resistance will be incorporated in accessible locations.

3.3.18 Photo Voltaic (PV) System

A Photo Voltaic (PV) system will be provided along the rooftop of the warehouse and office area of the building. WSP have provided assistance with investigations into optimal system capacity and configuration to date. Our findings have been presented within WSP consultant's advice CA-E-02 dated 29th March 2018 and CA-E-03 dated 6th April 2018, with final system capacity and configuration subject to feedback from DCI / Dicker Data and the relevant utilities.

3.3.19 Earthing

Earthing systems will be provided in accordance with Australian Standards and Supply Authority requirements throughout the building.

Earth bonding of structure will be provided to any installed substations and building.

Surge diversion will be installed at the main switchboard on the incoming supply. Surge diversion will also be provided for any copper communications cables entering building using surge diverter modules.

3.3.20 Communications Lead-in (Containment System Only)

A minimum of 2 x 100mm diameter lead-in conduits will be provided from the street to the ground floor office communication riser. Dicker Data will be required to enter an agreement with a telecommunications provider and arrange for the installation of all lead in cabling as required.

3.3.21 Communication Services

A rack will be provided in the warehouse to house all base building security services equipment (by others) as well as patch panels required for the termination of base building data outlets within the warehouse area. Data cabling will be Cat 6A copper cabling and will be terminated at RJ45 outlets.

Base building services equipment such as the mechanical Building Management System (BMCS), electrical meter Energy Monitoring System (EMS), computer monitored emergency lighting system etc. will be housed in the warehouse rack or in an alternate location agreed with Dicker Data.

Requirements for wireless access points in the warehouse area to be confirmed by Dicker Data.

Details of preferred communication rack (e.g. rack manufacturer, rack size, cable management) and cabling manufactures will need to be advised by Dicker Data.

3.3.22 Standby Power Generation

No spatial allowance has currently been included for standby power generation. WSP has investigated standby power generation options for the site, including the following options:

- Generation utilising diesel, natural gas or solar energy.
- Full power back up vs partial power back up.

Our findings have been presented within WSP consultant's advice CA-E-01 dated 21st March 2018 and is subject to feedback from DCI / Dicker Data.

4 FIRE PROTECTION SERVICES

This section of this report confirms WSP's understanding of the fire protection services design criteria, design scope and proposed system descriptions for the proposed Dicker Data development.

4.1 Design Criteria

4.1.1 Codes and Standards

The design concept for the Dicker Data development will allow for a design in line with the following codes and standards:

Fire Services System	BCA requirement	Australian Standard
Automatic fire sprinkler system	→ NCC Spec E1.5	→ AS2118.1-1999, FM Global DS2-0, DS8-9, and DS8-1
Fire hydrant system	→ NCC Clause E1.3	→ AS2419.1-2005
Fire hose reel system	→ NCC Clause E1.4	→ AS2441-2005
Fire detection and alarm system	→ NCC Spec E2.2a Clause 4	→ AS1670.1-2015
Smoke hazard management system	→ NCC Spec E2.2a Clause 5	→ AS1670.1-2015 and AS1668.1-2015
Building Occupant Warning System (BOWS)	→ NCC Spec E2.2a Clause 6	→ AS1670.1-2015
Portable fire extinguishers	→ NCC Spec E1.6	→ AS2444-2001

Further to this the systems will be designed and installed to conform with/to the approval of:

- → Fire and Rescue NSW
- → Sydney Water authority
- → Fire engineering requirements

4.2 System Descriptions

Fire protection services for the proposed Dicker Data development will include the following systems:

- → Automatic fire sprinkler system;
- → Fire hydrant system;
- → Fire hose reel system;
- → Automatic smoke detection and alarm system;
- → Building Occupant Warning System (BOWS); and
- → Portable fire extinguishers.

4.2.1 Automatic Fire Sprinkler System

An automatic fire sprinkler system shall be provided throughout the building.

The system is to include but not be limited to the following;

Automatic fire sprinkler system providing appropriate means of wet fire suppression and fire-fighting provisions for the operation of Fire & Rescue NSW, to the warehouse and office areas.

The fire sprinkler system infrastructure will be designed to allow for future extension, including the provision of sprinkler protection to the warehouse Stage 2 works.

Fire sprinkler system will be designed to the following hazard classifications;

- ESFR sprinkler system in the warehouse to FM DS2-0 & FM8-9
- Light hazard for office areas.

Sprinkler system will be provided with a Grade 2 water supply arrangement as per AS2118.1-1999 which comprises of 1 x 625,000 litres effective capacity and 1 x 413,000 litres effective capacity water storage tanks with an infill of 85 l/s into the reduced capacity tank from the incoming 300mm town main on Captain cook drive complete with a backflow prevention device.

The tank supply will be boosted to the sprinkler system via 2-off diesel booster pumps, located in the fire services pump room with the hydrant system booster pump.

Fire brigade booster arrangement comprising 2 x 150mm large bore & 12 x 65mm suction outlets and 12 x booster outlets will be provided within close proximity of the water storage tanks with the FRNSW hardstand requirements.

Sprinkler control valves will be provided within a fire sprinkler pump room with direct access to road or open space. Additional sprinkler control valves will be provided for future extension of sprinkler system in the warehouse and office building.

Fast response sprinkler heads as required to suit AS2118.1-1999 and Fire engineering requirements.

Final fire engineering requirements are yet to be determined.

4.2.2 Fire Hydrant System

Fire hydrant coverage will be provided throughout the warehouse and office building to comply with AS2419.1-2005. The fire hydrant system infrastructure will be designed to allow for future extension, including the provision of fire hydrant coverage to the future stage 2 warehouse and office areas.

Hydrant system will be supplied with an incoming connection off 300mm water main on Captain cook drive complete with a backflow prevention device. connection 40KL in-ground storage tank located outside the basement, utilising automatic towns main infill.

The tank supply will be boosted to the hydrant system via an electric booster pump, located in the fire services pump room with the sprinkler system booster pump.

Brigade booster enclosure will be provided on Captain cook drive within sight of the main building entry.

Fire Hydrant coverage will be achieved by ensuring all areas of the building can be adequately reached with a 30m OR 60m hose length and 10m nozzle spray from a fire hydrant outlet. Where adequate coverage cannot be achieved from hydrant outlets, additional hydrants will be provided to cover the shortfall area.

Hydrant outlets will have a minimum of 5l/s flow and 700kPa residual pressure at the 3 most disadvantaged hydrant outlets in the warehouse with the pump assistance and the system will be designed to deliver 10l/s @ 700kPa when boosted by the FRNSW appliance.

4.2.3 Fire Hose Reel System

Fire hose reel coverage will be provided to comply with AS2441-2005.

The fire hose reels will be supplied from the metered domestic water supply to each building.

Fire hose reels will be provided within 4m of each required fire exit. Additional hose reels will be provided to ensure all areas of the buildings are reached with a 36m hose and 4m of nozzle spray, and so hoses are not required to extend between fire compartments.

Fire hose reels will be supplied with a 19m diameter x 36m long hose.

Fire hose reels will have a minimum of 0.33L/c flow at the two most disadvantaged fire hose reels.

4.2.4 Automatic Smoke Detection and Alarm System

An analogue addressable looped smoke detection system complying with AS1670.1-2015 will be provided throughout the Dicker Data building (Stage 1 and Stage 2) for smoke hazard management system in accordance with BCA, AS1670.1-2015 and any relevant fire safety engineering requirements. The fire detection system infrastructure will be designed to allow for future extension, including the provision of fire detection and smoke hazard management.

An analogue addressable Main Fire Indicator Panel (FDCIE) will be provided at the designated building entry point of the office building, with the Alarm Signalling Equipment (ASE) for sending a fire alarm signal to the fire brigade via a remote monitoring service. A fire fan control panel, if required, will be provided adjacent to the fire indicator panel, to allow control of all essential services fans and dampers by the brigade.

Detectors will be provided at 15m spacing throughout protected occupied office areas, within warehouse areas, exit paths, at exit points and at lift shaft openings in accordance with AS1670.1-2015 requirements.

Duct probe detectors will be provided within supply and return air paths, and detectors provided within supply and return air plenums for smoke hazard management in accordance with AS1670.1 subject to final confirmation from BCA and fire safety engineering assessment.

A red strobe light and a bell alarm will be provided outside the designated main building entry to the building.

Interface will be provided with the building security system for monitoring and release of locked doors in egress path on a fire alarm.

Interface will be provided with the Building Occupant Warning System (BOWS) for evacuation of the building on a fire alarm.

Interface will be provided with fire sprinkler services and fire hydrant services including all the valves and pumps monitoring.

Interface will be provided with the mechanical services system for system shut down on a fire alarm.

Facility will be provided for isolation of incoming gas supply (if required by the client).

Interface will be provided with the building BMCS system, with the following outputs from the fire system;

- → Notification of fire alarm condition
- → Notification of a system alert condition (ie. pump run or fail, isolation valve tamper monitoring, etc)

Fire engineering requirements are yet to be determined.

4.2.5 Building Occupant Warning System (BOWS)

A Building Occupant Warning System (BOWS) will be provided through proposed Dicker Data development to provide controlled evacuation of the building in accordance with BCA and AS1670.1-2015. The building occupant warning system infrastructure will be designed to allow for future extension, including the provision of emergency warning to the future warehouse and office area extension.

A main evacuation control panel will be provided adjacent to the fire indicator panel to generate evacuation tone and signals throughout the building.

Occupant warning speakers will be provided throughout the building to emit a pre-recorded verbal evacuation message and evacuation tone to alert occupants of the need to evacuate the building. The speakers will be positioned to ensure they produce the required sound pressure level to all occupied areas in accordance with AS1670.1-2015.

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

Interface will be provided with smoke detection and alarm system.

4.2.6 Portable Fire Extinguishers

Portable fire extinguishers will be provided throughout the Facility to meet the requirement of relevant Australian Standards including AS 2444 and the NCC.

Portable fire extinguishers and fire blankets will be positioned and selected to suit the individual risk.

5 VERTICAL TRANSPORTATION SERVICES

This section of this report confirms WSP's understanding of the vertical transportation services design criteria, design scope and proposed system descriptions for the proposed Dicker Data development.

5.1 Design Criteria

5.1.1 Codes and Standards

The design concept for the Dicker Data Warehouse will allow for a design in line with the following codes and standards:

- NCC 2016 – Section E
- Relevant Occupation / Workplace Health and Safety Legislation
- AS1428.1 / 2 – Design for Access and Mobility
- AS1735.1 – Lifts, Escalators and Moving Walks - General Requirements
- AS1735.12 – Facilities for Persons with Disabilities
- AS/NZS3000 – Electrical Installations (Wiring Rules)
- EN81-20 – Safety rules for the construction and installation of lifts

5.2 Services Design Scope

Vertical Transportation services for the proposed Dicker Data development will include the following systems:

- Lifts

5.3 System Descriptions

5.3.1 Lifts

The lifts provided to the proposed development are as follows:

- Provision of two (2) passenger lifts to serve the commercial levels;
- Provision of one (1) exclusive passenger lift serving the Garage and Boardroom levels;

All lifts to be machine room less (MRL) solutions.

Lift provisions will be in accordance with the NCC.

Commercial lifts will have a rated load of 13 person / 1000Kg lifts

The Exclusive Boardroom lift will be a through car and have a rated load of 13 persons / 1000kg

5.3.1.1 Levelling

The lift will be capable of levelling to ±5mm under all circumstances.

5.3.1.2 Car Operation Panels

The new lifts will have two (2) car operating panels. Both car operating panels will be located on opposite side walls adjacent to the door of the lift car.

Car operating panels will have dual illuminating call buttons designed for people with disabilities. Button heights will be between 900 mm and 1,200 mm above finished floor level.

The lifts will be equipped for audible and visual indication of the progress of the lift to sight impaired persons and of the appropriate response to fire alarms and the operation of the lift under emergency power.

The new lifts will be provided with options to install security card readers.

The lifts will be equipped with a telephone designed for hands-free operation following the initiation of a call by the pressing of a single button. The telephone will be located to facilitate use by chair-bound persons.

5.3.1.3 Landing Call Stations and Hall Lanterns

There will be one (1) risers of call stations for each single lift and one (1) risers of call stations for each duplex lift with button(s) complying with AS1735.12.

Each lift will have One (1) hall lantern or lift identifier per landing with direction and audible indicators.

5.3.1.4 Landing and Lift Car Doors

The lift doors will be centre opening and the clear open width will suit the intended use.

The lift car doors will be provided with an infra-red detection system to detect approaching people or items to the door. The detection system must be dust proof and easy to maintain.

5.3.1.5 Car finishes

Car finishes will be durable, vandal resistant and of a standard commensurate with the design philosophy of the building.

Car finishes will be customised to architect's specification. Finish allowances to be agreed between lift contractor and architect.

The commercial lift will be in line with the standard range of finishes with the Garage VIP lift customised to architects specification.

The lift will be provided with handrails complying with AS1735.12.

5.3.1.6 Lighting

The lighting in the lift cars will be designed to preserve the visual comfort of passengers and tungsten filament type light fittings should be avoided.

An emergency lighting battery unit will be provided to each lift car to provide emergency lighting in the event of a loss of mains supply.

Lighting will be energy efficient LED type downlights.

Lift shaft lighting will be provided by the lift services to the relevant standards.

5.3.1.7 Ventilation

All lifts will be provided with at least 15 changes of air per hour. Any lift fan will be chosen to ensure that the noise within the car does not exceed 50dbA. There will be no discernible vibration caused by any fan.

The lift shaft will have provision for natural or mechanical ventilation as required. Ventilation will be suitably located as deemed fit by the lift manufacturer.

5.3.1.8 Electrical Interference and Harmonics

The lift installation will not cause interference with the operation of any electrical or electronic equipment within the facility.

5.3.1.9 Homing

The lift will home to the main public access level – Ground.

5.3.1.10 Protective Quilts

The commercial lift will be provided with one set of protective quilts for use when used for the transportation of bulky items such as office furniture.

5.3.1.11 Lift Control

The controls and operation of the lifts will be designed to incorporate:

- Fully automatic directional collective push button operation.
- Position and direction indicators in the lift cars.
- Transportation options such as electronic card access control.
- Remote locking and unlocking of car calls.

5.3.1.12 Major Plant and Equipment Items

Each lift installation has, but not limited to, the following major plant and equipment items:

- Electric traction machine located at within the headroom of the lift shaft;
- Lift car as described above;
- Lift and landing doors as described above;
- Counterweight
- Guide rails and guide brackets (spacing and components complying with earthquake standards);
- Lift shaft equipment.
- Control access panel; usually located at the highest landing lobby served, adjacent to the landing door.
- Car and landing operator panels and indicators as described above.
- Buffers located on pit floor.
- Overspeed tensioning governor

6 SERVICES AND SUSTAINABILITY

This section of the report provides a summary of the sustainability initiatives to be considered within the applicable services design development phase of this project:

- Solar power.
- LED lighting.
- Lighting control.
- Improved indoor air quality via improvement on minimum code requirements for ventilation, demand control ventilation (CO2 control), volatile organic compounds (VOC) sensors, low VOC product sections and improved air filtration.

These initiatives are provided in more detail within the WSP 'ESD Concept Design Report' dated 10th November 2017.

7 SUMMARY OF COMMERCIAL BASE BUILDING AND FITOUT SCOPES

This section of the report provides a summary of our understanding of the delineation between base building and fitout packages.

This has been prepared on the basis that an interim occupation certification is not required at the completion of base building construction.

7.1 Mechanical

System	Base building scope	Fitout scope
Air conditioning systems (including to service areas within the warehouse space)	→ All roof top packaged units complete with outside air ductwork. → All vertical supply air ductwork within risers. → All vertical return air ductwork within risers. → Capped on floor supply air connections. → On floor return air bell mouths.	→ Rigid ductwork from supply air capped connections. → All flexible ductwork, diffusers and grilles. → Variable air volume system in open plan areas and variable air volume diffusers in enclosed spaces. → Temperature sensors, as required. → Transfer boots, as required.
General exhaust systems	→ All roof top fans. → All vertical exhaust air ductwork within risers. → Capped on floor exhaust air connections.	→ Rigid ductwork from capped connections. → All flexible ductwork and grilles. → Make up air paths, as required.
Toilet exhaust systems	→ All roof top fans. → All vertical exhaust air ductwork within risers. → All on floor horizontal ductwork. → All grilles. → Make up air paths, as required.	→ N/A
Commercial kitchen exhaust systems	→ Roof top fan. → All vertical exhaust air ductwork within riser. → Capped on floor exhaust air connection.	→ Rigid ductwork from capped connection. → All flexible ductwork and connection onto kitchen exhaust hood. → Make up air paths, as required.

System	Base building scope	Fitout scope
Smoke exhaust systems, where applicable	→ Refer to air conditioning systems.	→ Refer to air conditioning systems.
Controls	→ BMCS infrastructure including head end, main controllers and network. → Control devices and programming of all base building systems, including air cooled packaged units, toilet exhaust fans, general exhaust fans and smoke exhaust fans.	→ Extension of base building system. → All required control devices and programming of any fitout specific items. → Modifications to programming of base building systems to suit fitout, as required.

7.2 Electrical

System	Base building scope	Fitout scope
Distribution boards	→ One floor distribution board within the electrical riser on ground level and level 2 of the office area (total 2 distribution boards). → One floor distribution board within the warehouse ground level 3PL area and level 1 services area (total 2 distribution boards). → Floor distribution boards will be provided unpopulated with separate chassis for lighting and power circuits. Each chassis will be provided with a private energy meter. → Connection of private energy meters to the BMCS system / an energy monitoring system if required.	→ Any additional distribution boards and associated private meters required for the fitout e.g. the café / kitchen, communications room, supplementary air conditioning distribution boards etc. → All sub-circuits (including required circuit breakers and residual current devices) required for the fitout.
Cable containment	→ Cable containment for reticulation of submains cabling to the distribution boards provided by base building → Cable containment for communications lead in cabling from the street to the	→ All cable containment required in risers (other than that installed for the base building electrical submain reticulation) e.g. cable tray required within the communication riser by fitout contractor. → All cable containment required for reticulation of

System	Base building scope	Fitout scope
	office ground floor communication riser. → Cable containment from the warehouse communication racks (if applicable) to the office ground level communications riser (for future installation of backbone cabling by fitout contractor). → Cable containment as required for the base building lighting and power outlets.	submains cabling to additional distribution boards required for the fitout → All on floor cable containment (including cable tray / basket, conduits, skirting wiring duct, caternary wire etc.) required for final sub-circuits.
Lighting, lighting control and Emergency Lighting	→ Plant rooms → Fire stairs → Garage and associated corridor → Office ground level and level 1 amenities, cleaner rooms and associated corridor.	→ All floor areas of the office building as well as the warehouse ground level 3PL area and level 1 service area. → External café seating area and level 2 balcony. → Lift lobby and air locks
Power outlets	→ Power outlets to base building equipment and within plant rooms only	→ Power outlets to all floor areas of the office building as well as the warehouse ground level 3PL area and level 1 service area.
MATV	→ A 6-way splitter will be provided on each floor within the communications riser.	→ Any field outlets required within the office building as well as the warehouse ground level 3PL area and level 1 service area. → Any additional splitters / amplifiers required to serve the fitout areas.
Public address system	→ Requirements for a public-address system are to be confirmed by Dicker Data.	→ Requirements for a public-address system are to be confirmed by Dicker Data.
Communication services	→ Phone outlets to the lifts, cabled back to the warehouse communication rack.	→ Any communication services required within the office building as well as the warehouse ground level 3PL area and level 1 service area. → Fibre backbone cabling from the warehouse communication rack to the office communication rack if required.

7.3 Fire Protection

System	Base building scope	Fitout scope
Automatic smoke detection and alarm system	→ Fire indicator panel. → Compliant smoke detector layout for open plan office.	→ Modifications to smoke detector layout to suit fitout.
Building Occupant Warning System (BOWS)	→ Main Evacuation Control Panel → Compliant speaker arrangement for open plan office.	→ Modifications to speaker arrangement to suit fitout.
Portable fire extinguishers	→ Fire extinguishers to suit an open plan office arrangement.	→ Additional fire extinguishers to suit fitout arrangement.
Automatic fire sprinkler system	→ Fire sprinkler infrastructure including storage tanks, pumps, alarm valves, pipework risers, etc. → Open plan sprinkler layout in offices i.e. high level sprinkler layout in offices.	→ Sprinkler modifications to suit fitout such as below ceiling sprinklers, etc.
Fire hydrant system	→ Fire hydrant infrastructure including pump. → Compliant hydrant coverage for open plan office.	→ Modifications to hydrant coverage to suit fitout to achieve compliant coverage.
Fire hose reel system	→ Compliant hose reel coverage for open plan office.	→ Modifications to hose reel coverage to suit fitout to achieve compliant coverage.

7.4 Vertical Transportation

System	Base building scope	Fitout scope
Lifts	→ Entire lift systems and controls.	→ N/A

8 SUMMARY OF PCA GUIDE TO OFFICE BUILDING QUALITY 2012 COMPLIANCE

This section of the report provides a summary of the PCA Guide to Office Building Quality 2012 'new buildings' requirements met.

8.1 Mechanical

PCA Guide to Office Building Quality 2012 'Grade A' for new buildings item	Does the WSP concept design meet this requirement? [Y/N]	Commentary, if required
C1. Air conditioning – maximum zone size ≤ 85m^2 perimeter zone and ≤120m^2 centre zone.	Y	The proposed air conditioning systems allow for the fitout designer to provide zoning to meet the minimum area requirements.
C2. Chilled beam density – Maximum area served per chilled beam ≤20m^2 perimeter zone and ≤35m^2 centre zone.	N	Not applicable to this development, as chilled beam technology is not proposed to be utilised.
C3. Tenant equipment, 12W/m^2	Y	
C4. Tenant supplementary loop, 20W/m^2	N	A separate tenant supplementary loop is not provided. However, air cooled packaged units have been included for within the WSP concept design to serve spaces of higher design occupancy, lighting and equipment i.e. for the meeting rooms and the café area.
C5. After hours operation, minimum of zones per floor and 600m^2 maximum zone size.	Y	This requirement will be considered during design development.
D1. General exhaust, 0.1L/s/m^2	Y	A general exhaust system is to be provided to the project, as required to meet minimum code requirements. The option of extending this system throughout the office building to allow for future expansion and connection will be explored during design development.
D2. Commercial kitchen exhaust, minimum of 1.	Y	
D3. Supplementary toilet exhaust, 0.1L/s/m^2	N	

PCA Guide to Office Building Quality 2012 'Grade A' for new buildings item	Does the WSP concept design meet this requirement? [Y/N]	Commentary, if required
D4. Supplementary outside air, 0.3L/s/m^2	Y	Outside air is to be provided via the packaged units. The inclusion of an outside air system to meet the PCA requirement to allow for future system flexibility will be explored during design development.
F5. BMCS system type	Y	Full BMCS including on floor control, energy management, comfort control, diagnostics and reporting.
Design occupancy of 1 person/10m^2	Y	The design occupancy for this project is the higher of 1 person per 10m^2; and the number of people as documented on the fitout layouts, including seats to breakout areas.

8.2 Electrical

PCA Guide to Office Building Quality 2012 'Grade A' for new buildings item	Does the WSP concept design meet this requirement? [Y/N]	Commentary, if required
F1. Power provision ≥ 50VA/m^2	Y	-
F2. Power factor ≥ 0.95	N	Space will be provided within the main switch room for the connection of future power factor correction equipment as part of the fitout scope of works (if required).
F3. Lighting efficiency W/m^2 per 100lux ≤ 2.5	Y	WSP note that most of the lighting installed within the office area will form part of the fitout scope of works. The lighting installed as part of the base building works will comply with this PCA requirement.
F4. Programmable lighting control zones ≤ 150m^2	Y	WSP note that most of the lighting installed within the office area will form part of the fitout scope of works. The lighting installed as part of the base building works will comply with this PCA requirement.
G1. Standby power for 1 lift per rise	N	To be confirmed upon resolution of standby power concept.
G2. Standby power for 100% of safety services (other than lifts)	N	To be confirmed upon resolution of standby power concept.

PCA Guide to Office Building Quality 2012 'Grade A' for new buildings item	Does the WSP concept design meet this requirement? [Y/N]	Commentary, if required
G3. Standby power for 50% of house light and power.	N	To be confirmed upon resolution of standby power concept.
G5. Standby power for tenant supplementary loop.	N	The proposed mechanical services arrangement does not have a tenant supplementary loop.
G6. Space provision for tenant generator/s	N	No specific space has been allocated for permanent standby generator facilities. WSP will provide this information upon resolution of standby power concept. Should a temporary generator be required WSP envision it will be located along the external perimeter of the building / in the carpark area. A connection point for a temporary generator can be provided at each main switchboard if required by Dicker Data.
G7. On site fuel storage for 12 hours of standby power operation	N	To be confirmed upon resolution of standby power concept.
I1. One tenant data riser per 30,000m^2 (or part thereof), minimum of two risers. Each riser must be physically separated	N	The intention of this metric is to ensure there is sufficient riser space available for lead-in cabling and backbone cabling between floors in a multi-tenanted building. The Dicker Data site will be occupied by a single tenant and as such there is no reason to provide separate risers for tenant and base building services. A single communication riser will be provided for all base building and fitout communication service cabling. WSP recommend locating all fitout floor communication rooms vertically on top of each other so that a new internal communication riser can be created if diverse backbone cabling paths are required between floors.
I2. Minimum of 1 Main Distribution Frame (MDF) room with at least two communication lead-ins from the property boundary.	N	No MDF room will be provided as part of the base building works. Telecommunication carrier lead-in cabling (organised by Dicker Data) will be reticulated from the street directly to the Dicker Data main communications room. The WSP design will include provision of 2 x 100mm diameter lead-in conduits from the street to the ground floor office communication riser.
I3. Master Antenna Television system with space in the riser for Pay TV.	Y	A free-to-air digital antenna (including digital radio) and Foxtel compliant satellite dish will be provided on the office building roof area for receipt of TV services. The TV services will be distributed to each level of the office building using RG6 coaxial

PCA Guide to Office Building Quality 2012 'Grade A' for new buildings item	Does the WSP concept design meet this requirement? [Y/N]	Commentary, if required
		cabling. A 6-way splitter will be provided on each floor within the communications riser.
I4. Provision of 2 communication carriers	N	Telecommunication carrier lead-in cabling is to be organised by Dicker Data. The WSP design will include provision of 2 x 100mm diameter lead-in conduits from the street to the ground floor office communication riser.
I5. In building mobile phone coverage to 100% of the gross floor area and lifts.	N	WSP have not been engaged to complete the design of a mobile phone Distributed Antenna System (DAS).

8.3 Fire Protection

Not applicable.

8.4 Vertical Transportation

PCA Guide to Office Building Quality 2012 'Grade A' for new buildings item	Does the WSP concept design meet this requirement? [Y/N]	Commentary, where required
E3. Waiting interval for Up Peak no more than 30 seconds for a Handling Capacity of 13%	Y	Waiting time at 1.3 seconds
E3. Waiting interval for Lunch Peak no more than 40 seconds for a Handling Capacity of 11%	Y	Waiting time at 3 seconds
E1. car capacity 16 person	N	The building is two floors and exceeds the stated waiting times
E5. Goods Lift	N	One of the two lifts will become a swing lift

9 WSP'S REQUEST FOR INFORMATION (RFI) LIST

Reference	Date	Query	Relevant party	Response date	Response from DCI, unless otherwise noted
G-01	7/11/2017	Please confirm building class is 7B warehouse and class 5 office.	BCA consultant	8/11/2017	Refer to initial BCA report provided 08/11/2017.
G-02	7/11/2017	Please provide BCA report / initial advice from BCA consultant identifying any services related non-compliances.	BCA consultant	8/11/2017	Provided 08/11/2017.
G-03	7/11/2017	Please confirm racking layout and racking heights.	WMK	17/11/2017	Racking layouts provided. Heights are required.
G-04	7/11/2017	Please provide architectural sections.	WMK	8/11/2017 17/11/2017	3300 slab-to-slab; 2700mm floor-to-ceiling in office. Sections to follow. Sections provided.
G-05	7/11/2017	Please confirm extent of vehicles e.g. forklifts, pickers, etc. within warehouse space.	DCI		
G-06	7/11/2017	Please confirm warehouse is for storage only i.e. no manufacturing.	DCI	8/11/2017	Confirmed
G-07	7/11/2017	Please provide commercial kitchen equipment schedule, data and layout.	WMK	8/11/2017	Unavailable at this stage. Kitchen to be regularly utilised for cooking for 80 - 100 people. Therefore, assume to be a "commercial kitchen" from a services perspective. Gas to be utilised for cooking.
G-08	7/11/2017	Please provide fire engineering report for existing building.	DCI		
G-09	7/11/2017	Please provide expected occupation of new site e.g. 15 years.	DCI	8/11/2017	Consider options within 25 years usable life.
G-10	7/11/2017	Please provide architectural elevations.	WMK	17/11/2017	Provided 17/11/2017.
G-11	22/12/2017	Please confirm whether interim occupation certificate is required upon completion of base building works	DCI	22/12/2017	
G-12	22/12/2017	Please confirm proposed occupancy for town hall mode / function mode.	DCI	22/12/2017	
G-13	1/02/2018	Please provide programme.	DCI		
M-01	7/11/2017	Please confirm that space cooling is not required to the warehouse space.	DCI	8/11/2017	Space cooling not required.
M-02	7/11/2017	Please confirm that space heating is not required to the warehouse space.	DCI	8/11/2017	Space heating not required.
M-03	7/11/2017	Please confirm humidity control in warehouse space is not required.	DCI	8/11/2017	Humidity control not required.
M-04	7/11/2017	Please confirm any significant equipment heat loads/gains within the office space.	DCI	8/11/2017	Utilise PCA Guide to Office Building Quality Grade A guidelines plus an allowance for additional occupants for 'town hall' mode / event mode within ground floor café area (200 people), additional occupants within meeting rooms as per preliminary fitout layouts and additional equipment load within configuration space (100 laptops).
M-05	7/11/2017	Please confirm population in warehouse space.	DCI	8/11/2017	Approximately 70 people.
M-06	7/11/2017	Please confirm air conditioning is required to staff café (numerous operable doors are shown on the architectural layouts)	DCI	8/11/2017	Air conditioning is required to staff café. Note for fitout designer that design conditions may not be met when doors are open.
M-07	7/11/2017	We are investigating options for air conditioning for the project. Please confirm project outlook period we are to consider when assessing payback periods e.g. 15 years.	DCI	8/11/2017	Consider options within 25 years usable life.
M-08	8/11/2017	Is a BMS required?	DCI	8/11/2017	Yes.
M-09	21/12/2017	Please confirm design criteria including proposed occupancy for town hall mode / function mode.	DCI		
M-10	21/12/2017	Please confirm any water and gas metering requirements.	Hydraulic consultant		
M-11	22/12/2017	Please confirm if an additional outside air system to meet Property Council of Australia Guide to Office Building Quality 2012 provisions is required to allow for future flexibilty.	DCI		
M-12	22/12/2017	Please confirm if an additional general air system to meet Property Council of Australia Guide to Office Building Quality 2012 provisions is required to allow for future flexibilty.	DCI		
M-13	22/12/2017	Please provide details of fork lift batteries for assessment of whether a dedicated exhaust system is required.	DCI		
F-01	7/11/2017	Please advise type of goods to be stored in the proposed warehouse for assessment to determine correct type of ESFR sprinkler heads for the warehouse space as per FM (Factory Mutual) datasheets.	DCI		
F-02	7/11/2017	Please confirm Insurer details, only if it is Factory Mutual (FM Global)	DCI	8/11/2017	Unknown. Proceed with concept without insurance information.
F-03	10/11/2017	Please confirm type of internal packaging e.g. expanded plastic (EP), unexpanded plastic (UP) etc, external packaging and type of pallets. Please refer to the attachment which gives guidelines on classifications required. Please ensure your response considers stage 2 goods as well. This information will allow us to undertake an assessment of whether ceiling only (early suppression, fast response) ESFR sprinklers can be utilised for the warehouse space.	DCI	22/12/2017	WSP" No longer applicable, as wet fire has been removed from WSP scope.

Reference	Date	Query	Relevant party	Response date	Response from DCI, unless otherwise noted
F-04	10/11/2017	Please note that racking will need to comply with specific racking requirements (see racking requirements tab, extract from FM global datasheet) to allow for use of ceiling only ESFR sprinklers. This will need to be confirmed with the racking system provider. Please refer to attached email for further details.	DCI	22/12/2017	WSP" No longer applicable, as wet fire has been removed from WSP scope.
S-01	7/11/2017	Please confirm whether the site is connected to sewer, or onsite wastewater treatment will be needed (this is to advise ESD design options)	DCI	8/11/2017	Sewer connection.
E-01	7/11/2017	Please confirm if there are any requirements for generator backed power to the base building or tenant installation. If a generator is required, please indicate how many hours backup is needed.	DCI	8/11/2017	No generator required.
E-02	7/11/2017	It is assumed that any UPS systems required will be provided as part of the fitout works. Please confirm.	DCI	8/11/2017	UPS systems to form part of fitout package of works.
E-03	7/11/2017	Energy meters will need to be installed for compliance with the BCA. Are there any client requirements to have the energy meters connected to the BMS or a separate system for monitoring / automated energy reporting?	DCI	8/11/2017	Yes via BMS. WSP to provide list of benefits to present to Dicker Data.
E-04	7/11/2017	Please confirm if there are any specific spaces that will have high power consumption. These areas may need dedicated distribution boards.	DCI	8/11/2017	Utilise PCA Guide to Office Building Quality Grade A guidelines plus an allowance for additional equipment load within configuration space (100 laptops). DCI to provide Information regarding proposed picking and forklift arrangements asap.
E-05	7/11/2017	Please confirm if there are any requirements for redundant communication risers in the office area i.e. diverse paths for backbone cabling between floors. A single riser can be provided in the core area and a second riser can be installed as part of the fitout works within the tenancy if required.	DCI	8/11/2017	Deviation from PCA Guide to Office Building Quality of two tenant risers, subject to WSP professional judgement required.
E-06	7/11/2017	Is there a preference for the lighting control system manufacturer / system e.g. cbus, dynalite, KNX et.	DCI	8/11/2017	No.
E-07	7/11/2017	Open office area lighting will automatically be switched on / off during normal business hours and motion detectors will be used to control the lighting after hours. Please confirm this is acceptable.	DCI	8/11/2017	WSP to propose most appropriate solution. Suggestion to include motion detectors within meeting rooms as well.
E-08	7/11/2017	During the site visit requirements for daylight harvesting in the warehouse where identified. Please confirm if this is correct. Daylight harvesting will be provided in the open office areas along the façade.	DCI	8/11/2017	WSP to propose most appropriate solution. Suggestion to include motion detectors within warehouse as well, as often certain aisles are not used for long periods of time.
E-09	7/11/2017	Are there any requirements for the emergency lighting system to be computer monitored?	DCI	8/11/2017	Yes.
E-10	22/12/2017	Please clarify if the existing warehouse site has a DAS room / clarify if they have currently have any issues with mobile phone reception. This will inform the need for a DAS room in the proposed site. Note that no allowance is currently made for DAS system design.	DCI		
E-11	22/12/2017	Please clarify if there are any requirements for a public address system in the office or warehouse area.	DCI		
E-12	22/12/2017	Please confirm if there are any requirements for a foxtel satellite dish. A free-to-air digital antenna (including radio) will be provided. Also please confirm if the TV distribution system is only required to the office area (not the warehouse).	DCI		
E-13	22/12/2017	Are there any specific requirements to interface the lighting with the access control system?	DCI		
E-14	22/12/2017	Please confirm whether a connection point to each main switchboard for temporary generators is required.	DCI		
E-15	22/12/2017	Please provide details of the forklift chargers, locations and quantities once available.	DCI		
E-16	22/12/2017	Is there any specialist equipment being installed within the warehouse are (other than the forklift chargers)? Please provide details.	DCI		