Newcastle Tower

711 Hunter Street Newcastle West NSW 2302

Electrical Capacity Report

Epicentre Consulting Engineers
2-14 Vine St
Redfern NSW 2016
ABN: 48 645 997 780

Table of Contents

1. Introduction

1.1. Purpose

This document is to investigate the Electrical Capacity for the site located at 711 Hunter St, Newcastle in response to the updated Newcastle DCP chapter 7.03.02 F. Electric vehicle parking.

1.2. Site location

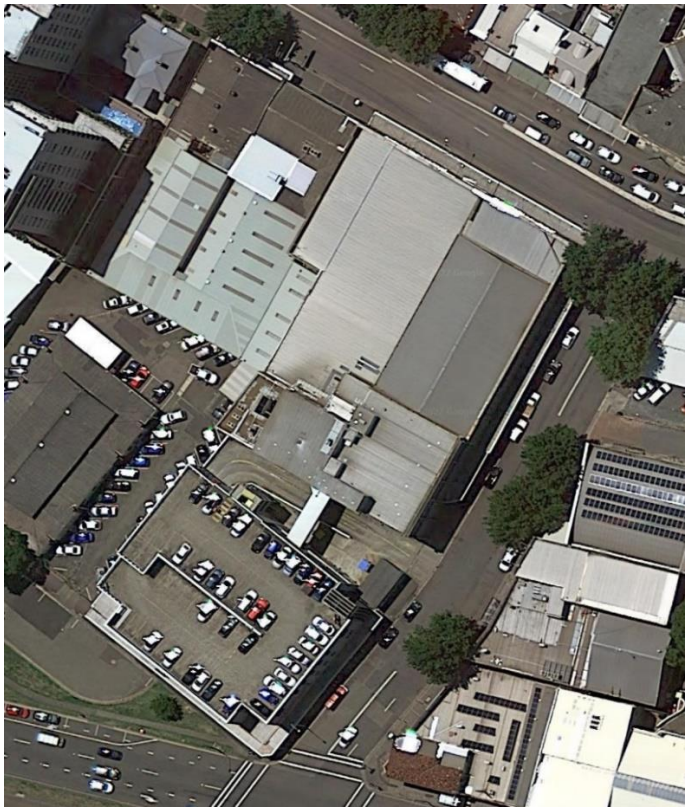

Figure 1.1 Proposed site – 711 Hunter St, Newcastle

1.3. Author Details

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1.4. Information Sources

- Information provided through DBYD

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1.8. Abbreviations

AS	Australian Standards
DBYD	Dial Before you Dig
DA	Development Application
Die	Diameter (distance)
m	Meters (distance)
m^2	Meters squared (area)
mm	Millimetres (distance)
uPVC	Unplasticized polyvinylchloride

1.9. Revision History

Revision	Date Issued	Comment
A	**25/10/2022**	**Draft Review**
B	**28/10/2022**	**Final Issue**

2. Electrical Services

2.1. Existing infrastructure

The following outlines the existing power services adjacent to the proposed site:

Based on the Ausgrid Energy Authority DBYD data there are existing services available within the vicinity of the site.

An application for a new load connection will have to be submitted with a maximum demand calculation.

There is an existing chamber substation on the development site with underground connection. The following figure shows the presence of the substation along the project site on National Park Street.

Refer to Appendix D for Ausgrid Energy network in proximity to the development.

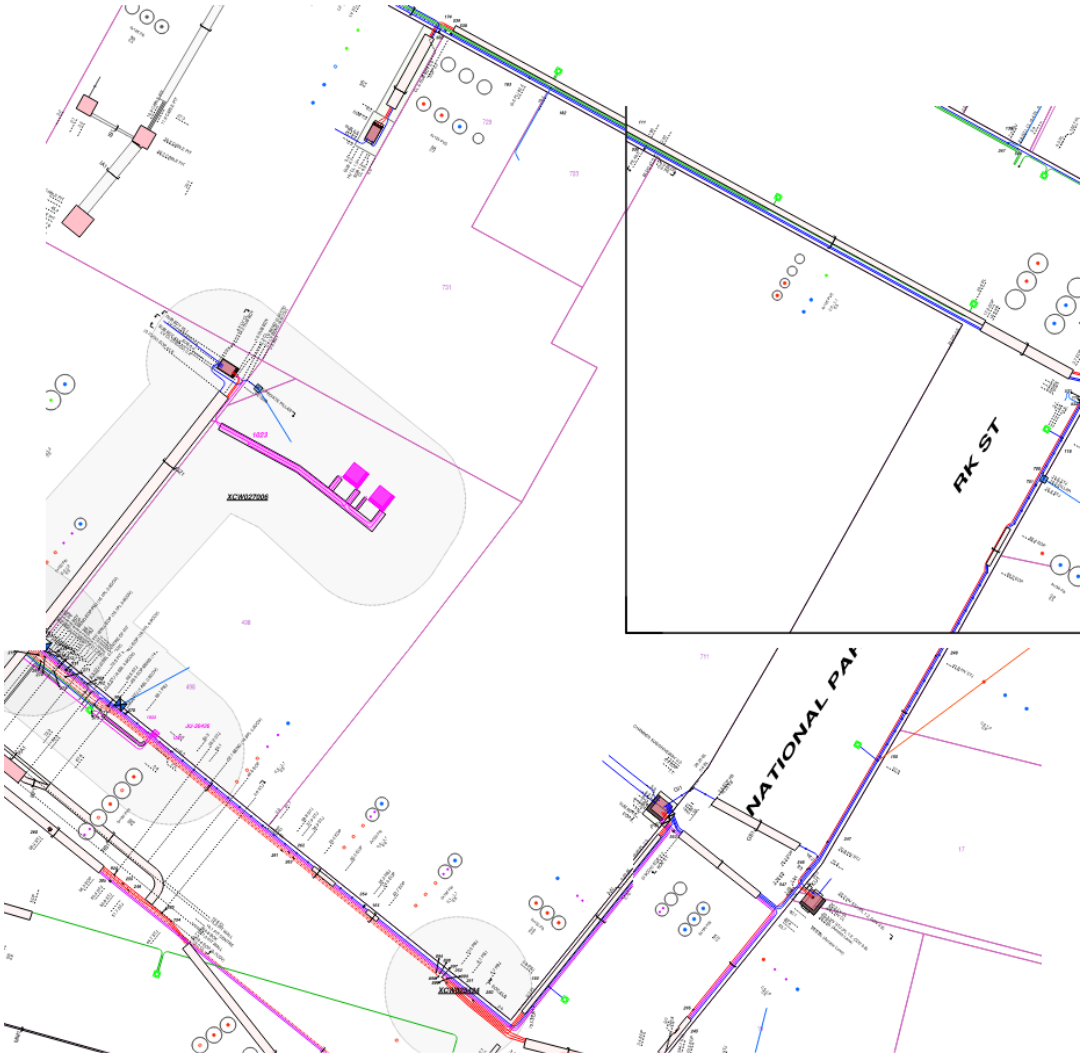


Figure 4.1- Ausgrid Energy services located on National Park Street

2.2. Proposed infrastructure

The following outlines the proposed power services for the proposed site:

Based on the proposed maximum demand excluding EV charging there is a requirement of 2 x 1MVA having 1 MVA chamber substation for stage 1 (MD = 1321A) and 1 MVA chamber substation for stage 2 (MD = 1190A) respectively with additional spare capacity of 300A/Phase. Which can cater for 36 car spaces out of 300 total car spaces to be EV ready for the development.

An application for a new load connection will have to be submitted with a maximum demand calculation.

There are existing chamber substation on the development site with underground connection. The following figure shows the presence of the substation along the project site on National Park Street.

Figure 4.1- Ausgrid Energy services located on National Park Street

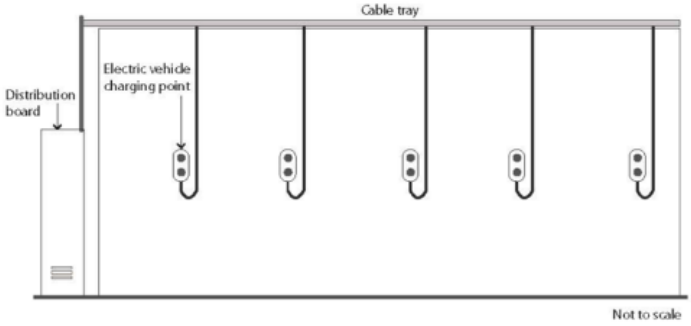
2.3. DA Condition - Newcastle DCP chapter 7.03.02 F. Electric vehicle parking

Electric circuitry to accommodate 'Level 2' or higher standard electric vehicle charging points must be integrated into all off-streetcar parking of new residential and non-residential development to ensure that 100% of car spaces can install electric vehicle charging points in the future. This must include:

(a) Ensuring adequate electrical capacity and infrastructure (cable size, distribution board size etc.) for the electric vehicle charging point system; and

(b) Providing either buried cables underground or cable trays sufficient to accommodate electric circuitry to each car space (see Figure 1 and Figure 2).

Figure 1 Electric vehicle charging points and electric circuitry provision in development with multiple car spaces using cable tray system Figure 2 Electric vehicle charging:



Minimum electric circuitry for a 'Level 2' electric vehicle charging point, if provided, is required to be:

(a) Privately available spaces: 'Level 2' slow – single phase with 7kW power or higher standard; and

(b) Shared spaces: 'Level 2' fast – three-phase with 11-22kW power or higher standard.

Provide EV Distribution Board(s) of sufficient size to allow connection of all EV Ready connections.

Locate EV Distribution Board(s) so that no future EV Ready connection will require a cable of more than 50 metres from the parking bay to connect.

The following calculation allows for 36 no. of car spots to be wired with Level 2 – 7kW single phase EV chargers. This contributes to about 12% of total car spaces that can be wired to have the development EV ready. This satisfies the minimum requirements of 5% of the total car spaces to be EV ready for this development as per the following condition 7.03.02F - item #8:

"Development must provide 1 car parking space or 5% of all car parking spaces – whichever is greater - to have a 'Level 2' or higher standard electric vehicle charging point installed."

EV Chargers				
EV Charging Provision @75% for Max demand calculation purposes as per AS3000:2018	36	5250	189.0	272.8
		Total		272.8

There are approximately 300 no. of car sports for this development therefore we will require an additional 264 car spaces to have provisions for the EV chargers.

Total additional power required for the development as provision for future connection when required is calculated as below:

EV Chargers				
EV Charging Provision @75% for Max demand calculation purposes as per AS3000:2018	264	5250	1386.0	2000.6
		Total		2000.6

The above calculation indicates that an additional 2MVA of provision will be required for the supply authority infrastructure to make 100% of the development's off-streetcar parking EV ready when required.

A formal application will have to be made with Ausgrid to determine and make provisions available for this development in the future.

This additional power supply provisions for EV charging will require additional space and layout modifications in future to cater for the additional load requirement when required. Refer Appendix B for typical layout diagram of chamber substation requirements if required in future.

The following options can be explored as alternatives to allow the intent of the Newcastle DCP chapter 7.03.02 F. Electric vehicle parking to be achieved:

1. As car charging is most likely to occur at night it is recommended that by introducing off peak EV charging for the development, it may be possible to cater for 100% of car charging for 100% of the car parking spaces. This can be done during the mid-morning or in between the hours of late night to early morning when there is minimum usage.
2. The administration / monitoring of EV charging can be done via a nominated provider and limitations can be in place to restrict power supply usage to maintain the overall power supply to site to its limits hence load shedding.

3. Recommendations

HV network is available along the development and there are existing substations which will need to be relocated or removed and replaced with new substations to cater for the new loads once a formal application is made to Ausgrid.
To make the new development 100% EV Ready, provisions for an additional 2MVA of loading will be required along with cable tray reticulation along the carpark levels including zoned area distribution boards in both stages of work, see Appendix C for initial proposed cable tray routes. Each EV DB provisions to be rated to approx. 250 – 400A 3 Phase or as required. All future EV electrical circuitry points will be fed from these EV distribution boards as required. Refer Appendix C for Electrical Plans and electrical circuitry provisions for reference.

The following options are to be explored after the DA has been approved, these are:

3. As car charging is most likely to occur at night it is recommended that by introducing off peak EV charging for the development, it may be possible to cater for 100% of car charging for 100% of the car parking spaces. This can be done during the mid-morning or in between the hours of late night to early morning when there is minimum usage.
4. The administration / monitoring of EV charging can be done via a nominated provider and limitations can be in place to restrict power supply usage to maintain the overall power supply to site to its limits hence load shedding.

4. Appendix A – Current Maximum Demand Calculation

Newcastle West Tower MAXIMUM DEMAND - ENERGY DEMAND METHOD REVISION 3					
	Loads Considered/Method	**Units/ Area**	**VA/unit or VA/m²**	**kVA Total**	**Total Amp/phase, 3 phases**
	Tower A - Stage 1				
	Common Areas (Based on Basix Report)				
	Carpark	7533	20	150.7	217.5
	Comms		-	9.0	13.0
	Fire Pump and Tank Room	115.47	20	2.3	3.3
	Water Meter	4.93	20	0.1	0.1
	Gas Meter	4.57	20	0.1	0.1
	Substation	45.31	20	0.9	1.3
	Access	11.01	20	0.2	0.3
	BOH	515.9	20	10.3	14.9
	Resi and Retail Waste	70.37	20	1.4	2.0
	Mail Room	15.54	20	0.3	0.4
	Lobby	55.58	20	1.1	1.6
	Waste Loading Zone	68.58	20	1.4	2.0
	Retail Area	438.07	200	87.6	126.5
			Total	265.4	383.1
	Level 1				
	Main Switch Room	41.27	20	0.8	1.2
	Commercial	207.8	100	20.8	30.0
	Waste	32.45	20	0.6	0.9
	Store	6.83	20	0.1	0.2
	Lobby	50.29	20	1.0	1.5
	WC	31.75	20	0.6	0.9
			Total	24.0	34.7

	Level 2				
	Lobby	20	20	0.4	0.6
			Total	0.4	0.6
	Level 3				
	Lobby	20	20	0.4	0.6
			Total	0.4	0.6
	Level 4				
	Lobby	20	20	0.4	0.6
	Store	53.6	20	1.1	1.5
			Total	1.5	2.1
	Level 5				
	Apartment units	4	3500	14.0	20.2
	Private Open Space	465.5	10	4.7	6.7
	WC	7.82	20	0.2	0.2
	Corridor	63.3	20	1.3	1.8
	BBQ Communal	91.25		16.5	23.8
			Total	36.6	52.8
	Level 6				
	Apartment units	4	3500	14.0	20.2
	Private Open Space	465.5	10	4.7	6.7
	WC	7.82	20	0.2	0.2
	Corridor	63.3	20	1.3	1.8
	BBQ Communal	91.25		16.5	23.8
			Total	36.6	52.8
	Levels 7-13				
	Apartment units	56	3500	196.0	282.9
	Corridor	66.7	20	1.3	1.9
			Total	197.3	284.8
	Level 14-16				
	Apartment units	24	3500	84.0	121.2
	Corridor	70.3	20	1.4	2.0
			Total	85.4	123.3

	Levels 17				
	Apartment units	7	3500	24.5	35.4
	Open Space	24.84	10	0.2	0.4
	Corridor	75.6	20	1.5	2.2
			Total	26.3	37.9
	Level 18-25				
	Apartment units	40	3500	140.0	202.1
	Corridor	58.2	20	1.2	1.7
			Total	141.2	203.8
	Level 26				
	Plant Room	137.33	20	2.7	4.0
	Corridor	25.4	20	0.5	0.7
			Total	3.3	4.7
	Lifts				
	Lift @125%	1	-	34.5	50.0
	Lift @75%	1	-	20.7	30.0
	Lifts @50%	3	-	41.4	60.0
			Total	96.6	140.0
	EV Chargers				
	EV Charging @75%	0	5250	0.0	0.0
			Total		0.0
			Total	914.9	1321.1
	Tower B - Stage 2				
	Common Areas (Based on Basix Report)				
	Carpark	4520	20	90.4	130.5
	Service	38.57	20	0.8	1.1
	BOH	96.57	20	1.9	2.8
	Waste/Store	19.63	20	0.4	0.6
	Retail Waste/Store	130.2	20	17.3	24.9
	Lobby	36.77	20	0.7	1.1
	Mail Room	15	20	0.3	0.4
	Retail Area	566.55	200	113.3	163.6

			Total	134.7	324.9
	Level 1				
	Bike Workshop	31.55	20	0.6	0.9
	Bike Store	132.22	20	2.6	3.8
	Waste/Store	67.43	20	1.3	2.0
	Lobby	52.45	20	1.0	1.5
	EOT	21.15	20	0.4	0.6
	Apartment units	3	3500	10.5	15.2
			Total	16.6	24.1
	Level 2				
	Apartment units	3	3500	10.5	15.2
	Lobby	57.7	20	1.2	1.7
	Store	31.93	20	0.6	0.9
			Total	12.3	17.7
	Level 3				
	Apartment units	3	3500	10.5	15.2
	Lobby	57.7	20	1.2	1.7
	Store	31.93	20	0.6	0.9
			Total	12.3	17.7
	Level 4				
	Lobby	57.7	20	1.2	1.7
	Store	31.93	20	0.6	0.9
	Apartment units	3	3500	10.5	15.2
			Total	12.3	17.7
	Level 5				
	Apartment units	4	3500	14.0	20.2
	Private Open Space	399.16	20	8.0	11.5
	WC	5.88	20	0.1	0.2
	Communal BBQ	75.02		16.5	23.8
	Corridor	33.1	20	0.7	1.0
			Total	39.3	56.7
	Level 6				
	Apartment units	4	3500	14.0	20.2
	Private Open Space	399.16	20	8.0	11.5
	WC	5.88	20	0.1	0.2
	Communal BBQ	75.02		16.5	23.8
	Corridor	33.1	20	0.7	1.0
			Total	39.3	56.7
	Levels 7-13				
	Apartment units	48	3500	168.0	242.5
	Corridor	37.9	20	0.8	1.1
			Total	168.8	243.6

	Level 14-16				
	Apartment units	15	3500	52.5	75.8
	Corridor	36.7	5	0.2	0.3
			Total	52.7	76.0
	Levels 17				
	Apartment units	5	3500	17.5	25.3
	Corridor	36.5	20	0.7	1.1
			Total	18.2	26.3
	Level 18-25				
	Apartment units	40	3500	140.0	202.1
	Corridor	38.7	20	0.8	1.1
			Total	140.8	203.2
	Level 26				
	Plant Room	212.42	20	4.2	6.1
			Total	4.2	6.1
	Lifts				
	Lift @125%	1	-	34.5	50.0
	Lift @75%	1	-	20.7	30.0
	Lifts @50%	2	-	27.6	40.0
			Total	82.8	120.0
	EV Chargers				
	EV Charging @75%	0	5250	0.0	0.0
			Total		0.0
			Total B - Stage 2	734.2	1190.8
			Total (A + B)	1649.1	2511.9

Calculation:

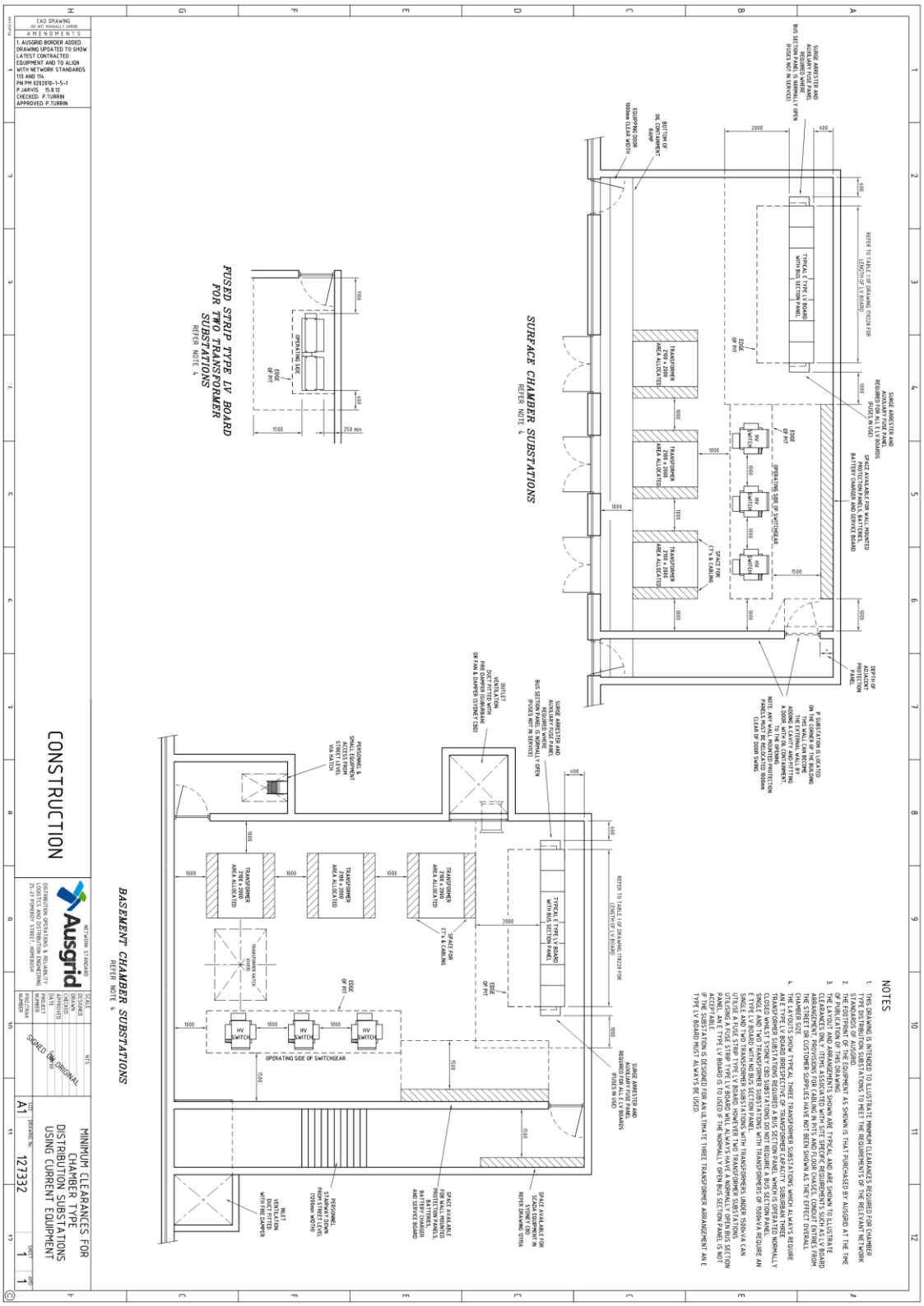
Total Capacity for 2 x 1MVA Transformers = 2 x 1393A 3 Phase per Transformer = 2786A

Balance for EV Charging Provision:

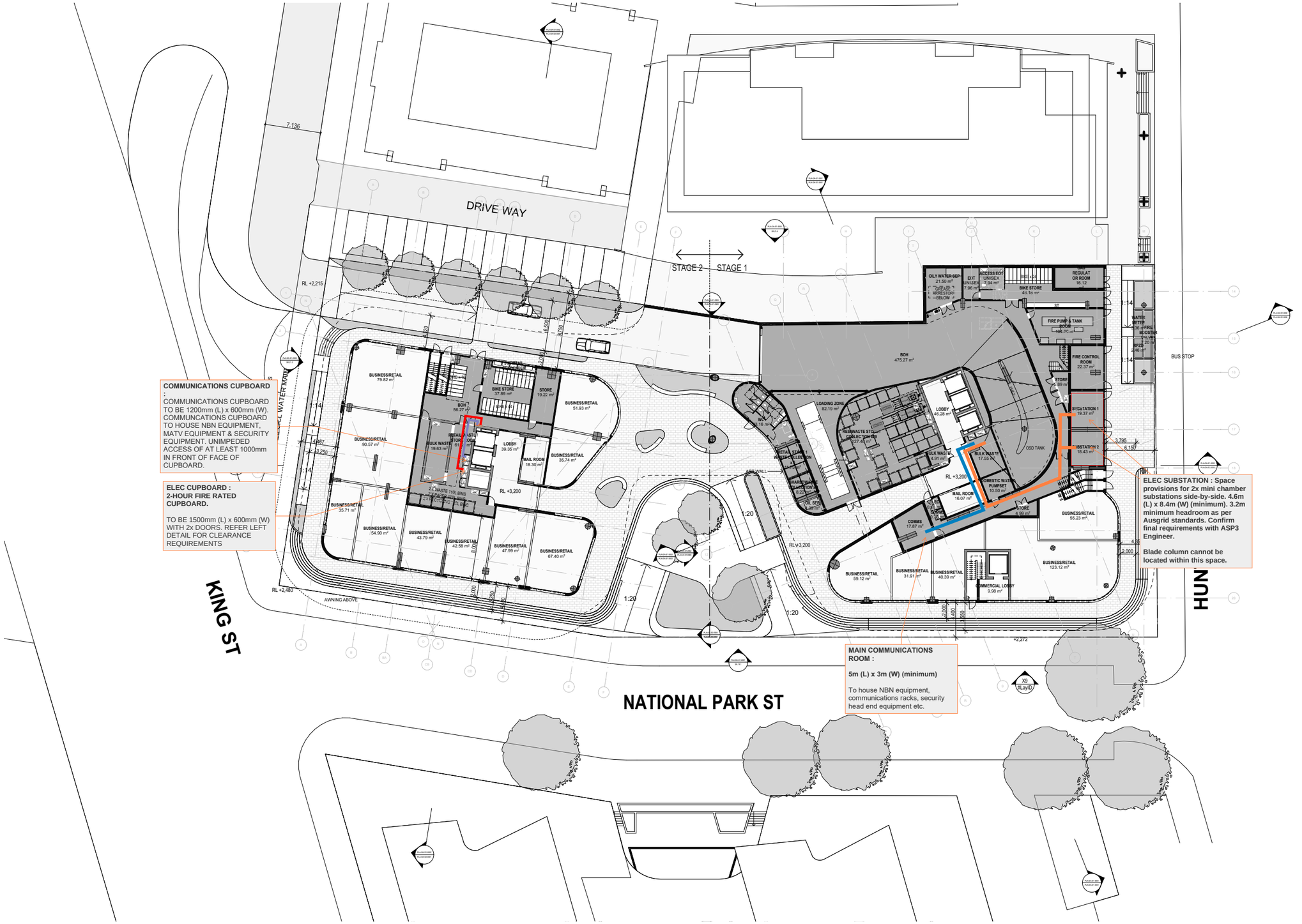
Total Transformer Capacity – Current Max Demand

= 2786A – 2512 = 274A per Phase

5. Appendix B – Ausgrid Chamber Type Distribution Substation



6. Appendix C – Electrical Plans for Power Infrastructure and Cable Tray Layouts



COMMUNICATIONS CUPBOARD :
COMMUNICATIONS CUPBOARD TO BE 1200mm (L) x 600mm (W). COMMUNCATIONS CUPBOARD TO HOUSE NBN EQUIPMENT, MATV EQUIPMENT & SECURITY EQUIPMENT. UNIMPEDED ACCESS OF AT LEAST 1000mm IN FRONT OF FACE OF CUPBOARD.

ELEC CUPBOARD : 2-HOUR FIRE RATED CUPBOARD.

TO BE 1500mm (L) x 600mm (W) WITH 2x DOORS. REFER LEFT DETAIL FOR CLEARANCE REQUIREMENTS

ELEC SUBSTATION : Space provisions for 2x mini chamber substations side-by-side. 4.6m (L) x 8.4m (W) (minimum). 3.2m minimum headroom as per Ausgrid standards. Confirm final requirements with ASP3 Engineer.

Blade column cannot be located within this space.

MAIN COMMUNICATIONS ROOM :

5m (L) x 3m (W) (minimum)

To house NBN equipment, communications racks, security head end equipment etc.

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SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

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StHilliers

Services Engineers:

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bsi. ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
GROUND FLOOR

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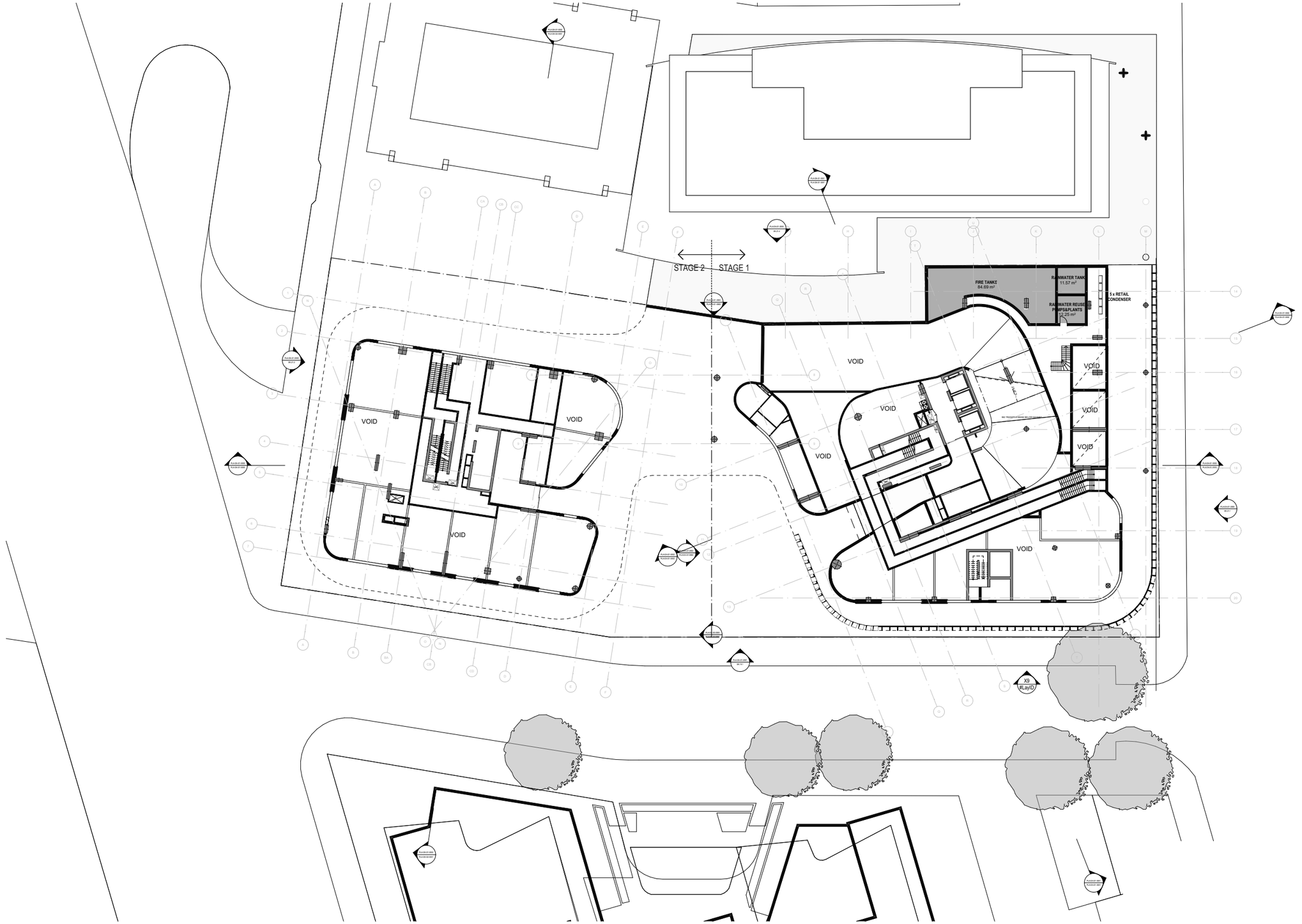
North Point:	Design: NN
	Design Validated:
	Amendment Approved:
	Drawn: NN
Date: APRIL 2022	Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	E	-100	SP	01

ORIGINAL SIZE: A1P



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ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
MEZZANINE LEVEL

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North Point:	Design: NN
	Design Validated:
	Amendment Approved:
	Drawn: NN
Date: APRIL 2022	Scale: 1:200 @A1

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	E	-101	SP	-01

ORIGINAL SIZE: A1P

Secondary Electrical Room.

To house Stage 2 MSB, House DB, EV Charging DB

Stage 2 Power Supply.

Electrical cable tray for mains cabling from substation room to stage 2 main switchboard.

CABLE SUPPORT SYSTEM :

300mm wide cable tray for future electric circuitry for EV charging points as required.

MAIN COMMUNICATIONS ROOM :

5m (L) x 3m (W) (minimum)

To house NBN equipment, communications racks, security head end equipment etc.

ELEC MAIN SWITCHROOM :

5m (L) x 6m (W) (minimum)

Must be 2 hour fire rated and have 2 hour fire rated self-closing fire doors.

Requires 2 emergency exit paths. Doors need to open in the direction of egress (outwards) without the use of a key or tool. The doors should be spaced well apart (i.e. on opposite side of the room).

CABLE SUPPORT SYSTEM :

600mm wide cable tray for sub-mains cabling to meter panels at residential levels.

CABLE SUPPORT SYSTEM :

300mm wide cable tray for future electric circuitry for EV charging points as required.

STAGE 2 STAGE 1

RESI VISITOR CAR SPACE

COMMERCIAL CAR SPACE

SECURITY GATE

MAIN SWITCH ROOM 38.27 m²

MAIN COMMS ROOM 15.65 m²

COMMERCIAL 222.68 m²

KING ST

NATIONAL PARK ST

HUNTER ST

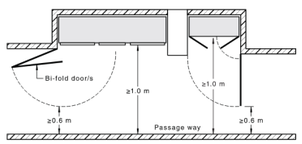

FIGURE 2.22 ACCESS TO SWITCHBOARDS—SWITCHBOARD DOORS THAT OPEN INTO ACCESS WAYS OR NARROW PASSAGE WAYS

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SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

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NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 1

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North Point:	Design: NN
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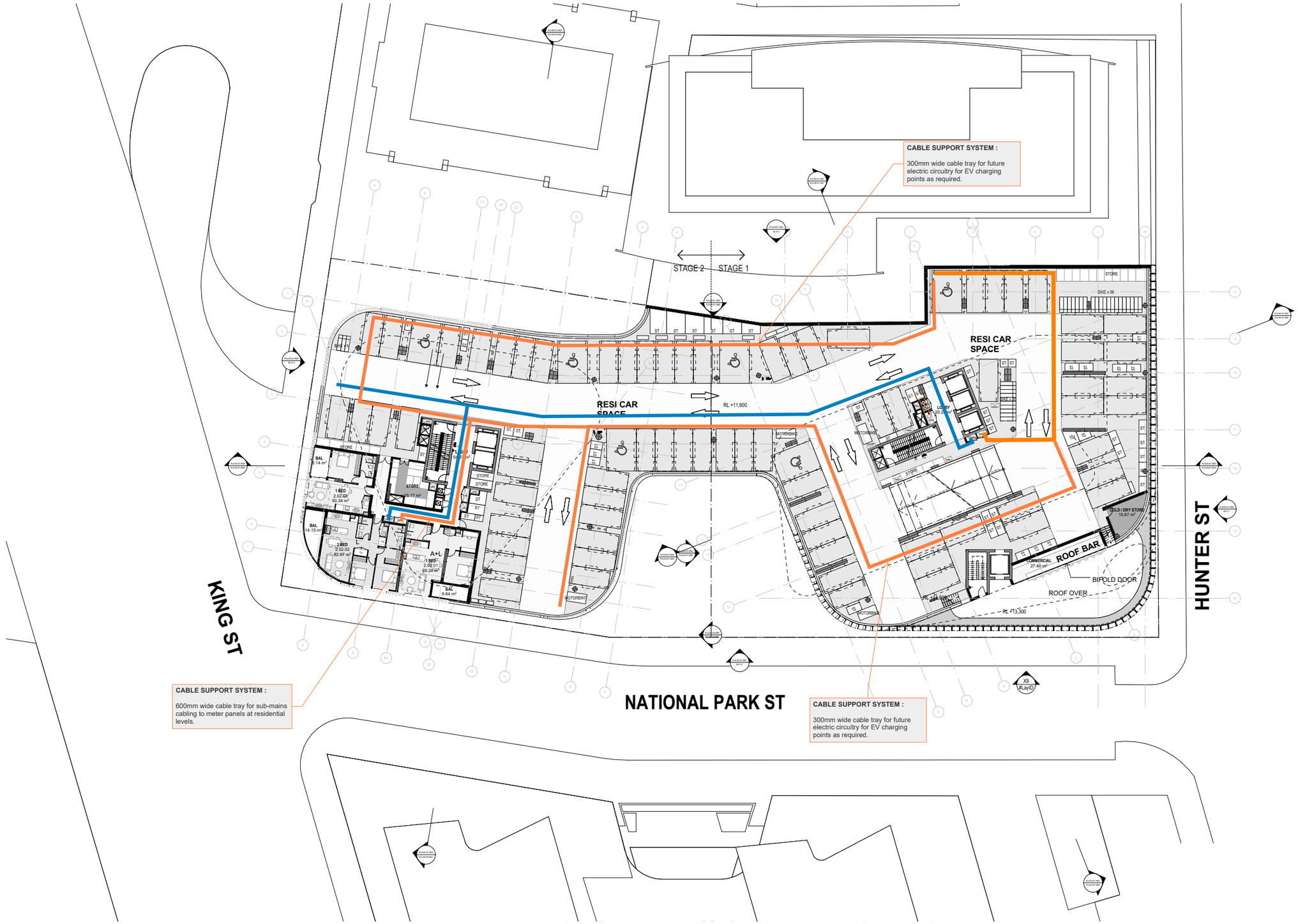

CABLE SUPPORT SYSTEM :

300mm wide cable tray for future electric circuitry for EV charging points as required.

CABLE SUPPORT SYSTEM :

600mm wide cable tray for sub-mains cabling to meter panels at residential levels.

CABLE SUPPORT SYSTEM :

300mm wide cable tray for future electric circuitry for EV charging points as required.

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bsi. ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 2

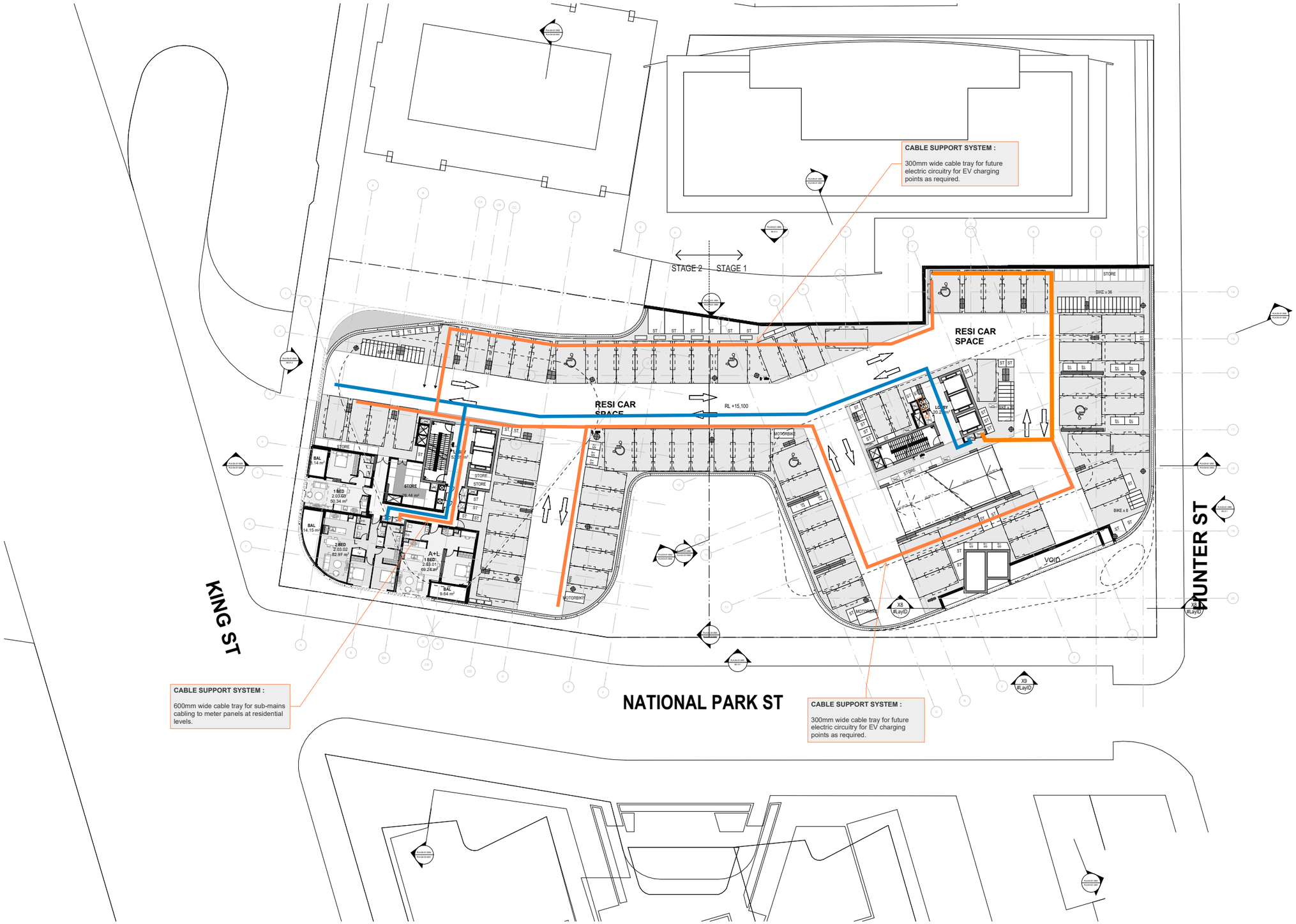
NOT FOR CONSTRUCTION

North Point:

Design: NN
Design Validated:
Amendment Approved:
Drawn: NN
Date: APRIL 2022
Scale: **1:200 @A1**

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	- E	-103	- SP	-01

ORIGINAL SIZE: A1P



ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

NOTES:
- DRAWING SHALL BE PRINTED IN COLOUR.
- SYMBOLS ARE DRAWN IN CORRECT LOCATION.
- DO NOT SCALE THIS DRAWING. FIGURED DIMENSIONS TO BE USED ONLY.
- DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED ON DRAWING.

Client/Architect:

StHilliers

Services Engineers:

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ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

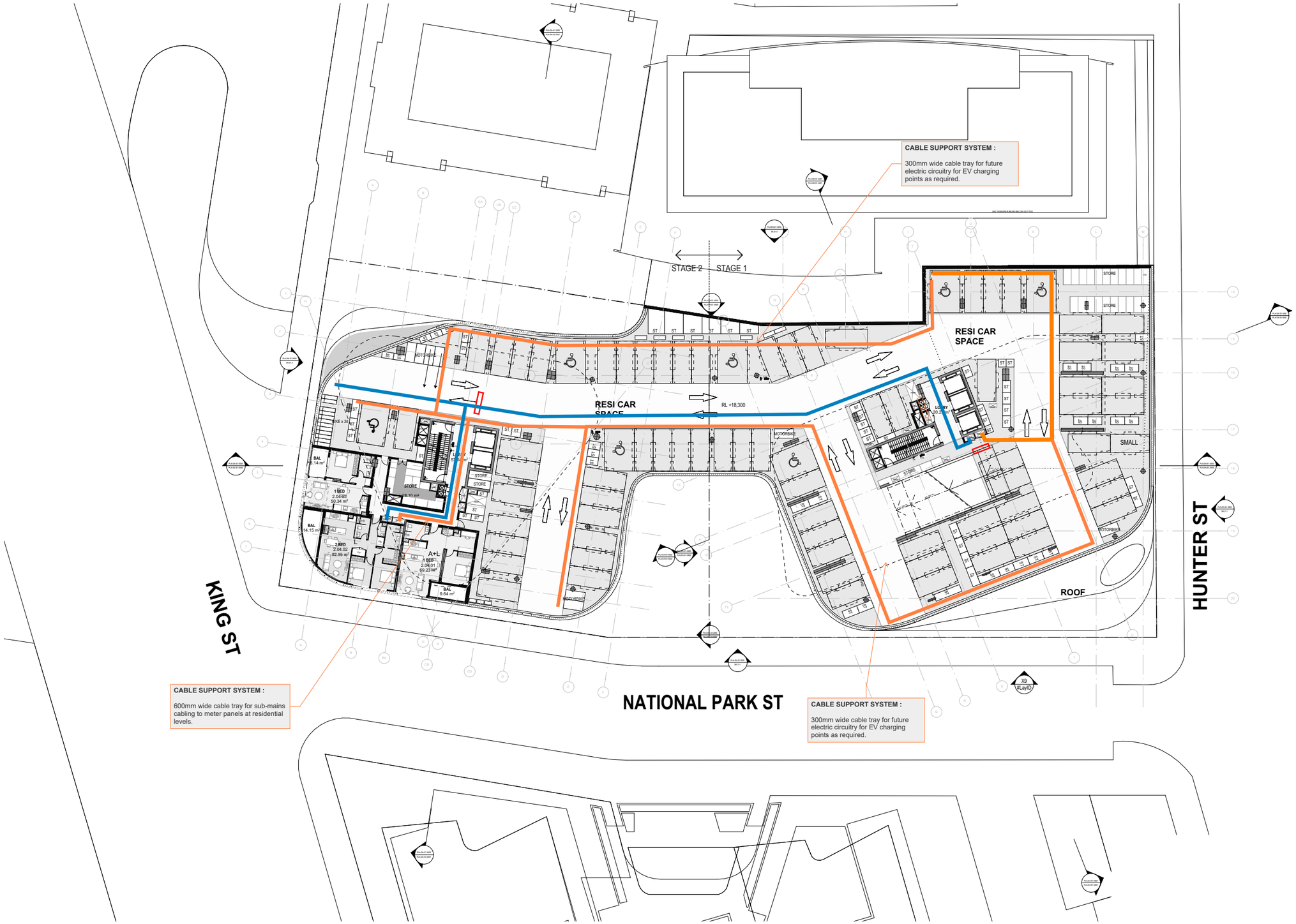
ELEC SPATIALS
LEVEL 3

NOT FOR CONSTRUCTION

North Point:	Design: NN
	Design Validated:
	Amendment Approved:
	Drawn: NN
Date: APRIL 2022	Scale: 1:200 @A1

Job No.:	Disc:	Dwg No.:	Stage:	Issue:
22542-001	E	-104	SP	01

ORIGINAL SIZE: A1P



ISSUE	DATE	AMENDMENT	INT.	APP.
SP01	XX.XX.22	COMBINED SPATIALS	MW	CO

CO-ORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	DATE
ARCH		
CIVIL		
ELEC		
MECH		
RCP		
STRUCT		

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Client/Architect:

StHilliers

Services Engineers:

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ISO 9001 Quality Management

Project:

711 HUNTER ST
NEWCASTLE WEST
NSW 2302

Drawing Title:

ELEC SPATIALS
LEVEL 4

NOT FOR CONSTRUCTION

North Point:	Design: NN
	Design Validated:
	Amendment Approved:
	Drawn: NN
Date: APRIL 2022	Scale: **1:200 @A1**

Job No.: 22542-001 - Disc: E - Dwg No.: -105 - Stage: SP - Issue: 01

ORIGINAL SIZE: A1P