

# NEW WAREHOUSE

## 39 CERES DRIVE THURGOONA NSW 2640

### ELECTRICAL SERVICES



**CENTRIC**  
Building Services Engineers

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**39 CERES DRIVE**  
**THURGOONA NSW 2640**

Project Number:  
**24071**

Drawing Number:  
**E000**

Revision:  
**P1**

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DRAWING SCHEDULE:		E201	LEVEL M FLOOR PLAN LIGHTING LAYOUT
NUMBER	TITLE	E300	ELECTRICAL SCHEMATIC
E000	COVERSHEET, LEGENDS AND DRAWING LIST		
E001	ELECTRICAL SPECIFICATIONS		
E002	SITE PLAN		
E100	LEVEL G FLOOR PLAN POWER AND COMMUNICATIONS LAYOUT		
E101	LEVEL M FLOOR PLAN POWER AND COMMUNICATIONS LAYOUT		
E200	LEVEL G FLOOR PLAN LIGHTING LAYOUT		

#### EMERGENCY LUMINAIRES

E1	CLEVERTRONICS RECESSED NON-MAINTAINED ECONOMY LITHIUM LIFELIGHT. AS2293 CLASSIFICATION; C0=D40; C90=D40
E2	CLEVERTRONICS SURFACE MOUNTED NON-MAINTAINED ECONOMY LITHIUM LIFELIGHT. AS2293 CLASSIFICATION; C0=D40; C90=D40
V1E	45W LED SURFACE MOUNTED BATTEN, IP65, IK08, MAINTAINED TYPE, TYPE: PIERLITE BWP ECO LED EMERGENCY WEATHERPROOF BATTEN CLASSIFICATION: C0= D63, C90= D50
EX1	SURFACE MOUNTED LED EXIT SIGN, MAINTAINED, AS2293 CLASSIFICATION C0=D3.2 C90=B16. VIEWING DISTANCE 24m.CLEVERTRONICS CLEVERFIT PRO
EX1	AS ABOVE SPECIFICATION C/W DIRECTIONAL PICTOGRAPH AS INDICATED ON LAYOUT DRAWINGS

#### LUMINAIRES

D1	15W DOWNLIGHT RECESSED FIXED, POWDER COATED WHITE, 4000K, IP44, 1163lm. THORN LIGHTING - BASE PRO / BASE PRO
R1	31W ULTRA SLIM RECESSED LED MODULAR LUMINAIRE, 4000K, IP40, 3636lm. THORN LIGHTING - ROYAL PRO
S1	26W LINEAR, WATER RESISTANT LED LUMINAIRE, 4000K, IP65, 2777lm. THORN LIGHTING - WEATHER FORCE
HB1	150W LED HIGH BAY LUMINAIRE WITH WIDE BEAM OPTIC, 4000K, IP65, 21000lm. TREND LIGHTING -BAYLED TPU90150. CONTACT GREG SHEPHERD CONTACT NO: 0421004941.
FL1	120W HIGH POWER LED FLOODLIGHT ASYMMETRIC LIGHT, 4000K, IP66, 15027lm. THORN LIGHTING - LEO FLEX IP66 120W
PL1	51.1W LED ROAD LIGHTING LANTERN WITH EXTRA WIDE ROAD OPTIC, 4000K, IP66, 7751lm. THORN LIGHTING - ISARO PRO / IP 24L70 740 EWR M BS 3550 CL2 M60 ANT.

#### LIGHTING CONTROL

X#B	LIGHT SWITCH - PUSH BUTTON SWITCH CLIPSAL ICONIC 3000 SERIES, WHITE COLOUR. #B; DENOTES NUMBER OF BUTTONS ON SWITCH PLATE 2P = TWO POLE SWITCH 2W = TWO WAY LIGHT SWITCH 3P = THREE POLE SWITCH 3W = THREE WAY SWITCH AH = AFTER HOURS AOM = AUTO-OFF-MANUAL (3 POSITION) SWITCH D = DIMMABLE LIGHT SWITCH INT = INTERMEDIATE LIGHT SWITCH IR = INFRA-RED SWITCH WITH 15min DELAY OFF, PROVIDE AUTO/OFF/ON SWITCH K = KEY OPERATED SWITCH L = 25mm MECHANISMS T = TIME SWITCH - ELECTRONIC (10 AMP) F = FAN CONTROLLER FAN + LIGHT SWITCH
PE	WEATHER PROOF IP56, 10A, PHOTO ELECTRIC CELL. FROM HPM
TS	TIME SWITCH CONTROLLED
MS	MOTION SENSOR - RECESSED
MS	MOTION SENSOR - SURFACE MOUNTED

#### POWER

kw	SUPPLY AUTHORITY METER
EM	PRIVATE ENERGY METER
	SURGE DIVERTER
	FUSE
	EARTH
E	ELECTRICAL DRAINAGE CABLE PIT
C	COMMUNICATIONS CABLE PIT
Ø	DIRECT CONNECTION - SINGLE PHASE
Ø	DIRECT CONNECTION - THREE PHASE
	SINGLE 10A SWITCHED SOCKET - OUTLET CLIPSAL ICONIC 3000 SERIES, WHITE COLOUR.
	DOUBLE 10A SWITCHED SOCKET - OUTLET CLIPSAL ICONIC 3000 SERIES, WHITE COLOUR.
EP	ELECTRICAL PILLAR
MSB	MAIN SWITCH BOARD
DB-X	DISTRIBUTION BOARD
DB-X	SWITCHBOARD BY OTHERS HYD - HYDRAULIC (CENTRAL HWU SYSTEM) LIFT - VERTICAL TRANSPORTATION MCC- MECHANICAL CONTROL PANEL
MP	METERING PANEL
	ISOLATOR
	CIRCUIT BREAKER
	CIRCUIT BREAKER - RCD

	REMOVABLE LINK
—x	SPARE CIRCUIT BREAKER POLES
/	SINGLE PHASE
≡	THREE PHASE

#### COMMUNICATIONS

	TELECOMMUNICATIONS OUTLET RJ45 (CAT 6). CLIPSAL ICONIC 3000 SERIES, WHITE COLOUR.
TV	FTA TELEVISION OUTLET ON ONE PLATE. CLIPSAL ICONIC 3000 SERIES, WHITE COLOUR.
BUDI-S	BUILDING FIBRE DEVICE - SMALL/MEDIUM DEVELOPMENTS
NTD	NETWORK TERMINATION DEVICE, PROVIDE WITH DOUBLE 10A SOCKET OUTLET FOR POWER SUPPLY.
FDT	FIBRE DISTRIBUTION TERMINAL
SOT	SPLITTER DISTRIBUTION TERMINAL
4G	4G WIFI RADIO MODEM ROUTER UNITS ARE PROVIDED FOR WASTER/GAS METERS, LIFT AND FIP. PROVIDE CAT6 TO CABLE BACK TO THE COMMUNICATION RACK. 4G NETWORK CAPABLE AND 8HR BATTERY LIFE BACK UP.
Y	MATV AERIAL ANTENNA TO BE MOUNTED ON THE ROOF. THE LOCATION SHOWN IS INDICATIVE AND SUBJECT TO ON SITE SIGNAL STRENGTH TESTING. FROM CLIPSAL.
SCP	SECURITY CONTROL PANEL
R	DOOR CONTACT - REED SWITCH
K	KEY PAD
K	KEY PAD AND CARD READER
	CARD READER
ES	ELECTRIC STRIKE DOOR LOCK
MLD	ELECTROMAGNETIC DOOR LOCK
DVR	CCTV DIGITAL VIDEO RECORDER
NVR	CCTV NETWORK VIDEO RECORDER

#### SECURITY

#### ABBREVIATIONS

3PH	THREE PHASE
AB	ABOVE BENCH
AD	AUTO DOOR (PROVIDE 240V, 10AMP SINGLE GPO AT HIGH LEVEL).
BWU	BOILING/CHILLED WATER UNIT
CL	CLEANERS OUTLET (WIRE ON SAME CIRCUIT)
CM	CEILING MOUNTED
C	COFFEE MACHINE
CT	COOK TOP
CWP	COLD WATER PUMP
DR	CLOTHES DRYER
DW	DISH WASHER
FIP	FIRE INDICATOR PANEL
F	FRIDGE
HD	HEAVY DUTY
HWU	HOT WATER UNIT (CENTRAL ELECTRIC HOT WATER PLANT)
IC	IN CEILING
IJ	IN JOINERY
JP	JACKING PUMP
LO	LOCKER
MDL	METER DATA LOGGER
MW	MICROWAVE
OV	OVEN
RH	RANGEHOOD
RSD	ROLLER SHUTTER DOOR
RWP	RAINWATER PUMP
SM	SURFACE MOUNT
TV	TELEVISION
UB	UNDER BENCH
UG	UNDERGROUND
USB	SOCKET OUTLET INCORPORATING USB OUTLETS
WM	WASHING MACHINE
WP	WEATHERPROOF
AC	AIR CONDITIONING
A	A = 150mm ABOVE BENCH
B	B = 600 ABOVE FLOOR
C	C = 1100 ABOVE FLOOR
D	D = 1500 ABOVE FLOOR
E	E = 1800 ABOVE FLOOR
F	F = 2200 ABOVE FLOOR
U	U = UNDER BENCH

#### LINETYPES

—————	BUS BAR
—————	CIRCUIT WIRE
-----	SWITCH WIRE
—————	BOARD PANEL OUTLINE
—P—P—P—P—P—P—	P - POWER
—C—C—C—C—C—C—	C - COMMUNICATIONS
}	CONTINUATION LINE



## ELECTRICAL SPECIFICATION

### GENERAL

CARRY OUT ALL WORK IN ACCORDANCE WITH AS/NZS 3000, THE CURRENT ITERATION OF THE NCC (2022), THE REQUIREMENTS OF THE SUPPLY AUTHORITY, AS WELL AS ALL RELEVANT AUSTRALIAN STANDARDS, AND LICENSING AUTHORITIES.

DRAWINGS TO BE READ IN CONJUNCTION WITH ALL OTHER SERVICES DOCUMENTS, INCLUDING BUT NOT LIMITED TO ARCHITECTURAL, STRUCTURAL, FIRE, HYDRAULICS AND MECHANICAL SERVICES.

CO-ORDINATE ALL WORKS ON SITE WITH ALL OTHER TRADES TO AVOID SITE DIFFICULTIES. CONFIRM EXACT LOCATION AND ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT AND EXACT LOCATIONS PRIOR TO INSTALLATION.

REFER TO ARCHITECT/INTERIOR DESIGNER DRAWINGS FOR MOUNTING HEIGHTS FOR POWER AND DATA OUTLETS.

ANY MATERIALS, APPARATUS ETC., NOT SHOWN ON THE DRAWINGS, BUT WHICH IS MENTIONED IN THIS SPECIFICATION OR VICE VERSA, SHALL BE SUPPLIED AND INSTALLED AT NO EXTRA COST. ANY SERVICES, ITEM OF WORK OR SMALL DETAIL NOT USUALLY SPECIFIED BUT INFERRED AND NECESSARY FOR THE SATISFACTORY OPERATION OF THE SYSTEM OR INSTALLATION, SHALL BE PROVIDED BY THE SUB-CONTRACTOR WITHOUT ANY ADDITIONAL EXPENSE TO THE PROPRIETOR.

IF NEITHER THE SPECIFICATION NOR THE DRAWINGS CONTAIN ANY PARTICULARS OF MINOR PARTS, WHICH ARE NEVERTHELESS CLEARLY TO BE INFERRED OR MINOR PARTS, WHICH ARE NECESSARY FOR THE COMPLETION OF THE WORK UNDER THE SUB-CONTRACT, ALL SUCH PARTS SHALL BE SUPPLIED AND EXECUTED BY THE SUB-CONTRACTOR WITHOUT EXTRA CHARGE.

### STANDARDS AND CODES

ALL WORK SHALL BE IN ACCORDANCE WITH THE FOLLOWING:

- NATIONAL CONSTRUCTION CODE AND BUILDING PERMIT CONDITIONS;
- AS 1680 INTERIOR LIGHTING GENERAL PRINCIPLES;
- AS 1768 LIGHTNING PROTECTION
- AS 2293 EMERGENCY ESCAPE LIGHTING AND EXIT SIGNS FOR BUILDINGS;
- AS 3000:2018 WIRING RULES;
- AS 3008 ELECTRICAL INSTALLATION, SELECTION OF CABLES;
- AS 3010 ELECTRICAL INSTALLATION; GENERATING SETS
- AS 3013 ELECTRICAL INSTALLATION; CLASSIFICATION OF THE FIRE AND MECHANICAL PERFORMANCE OF WIRING SYSTEM ELEMENTS
- AS 3017 ELECTRICAL INSTALLATIONS; VERIFICATION GUIDELINES
- AS 3100 APPROVAL AND TEST SPECIFICATION; GENERAL REQUIREMENTS FOR ELECTRICAL EQUIPMENT.
- AS 3111 APPROVAL & TEST SPECIFICATION, MINIATURE OVER-CURRENT CIRCUIT-BREAKERS.
- AS 3147 PVC INSULATED ELEC. CABLES AND FLEX. CABLES FOR WORKING VOLTAGES OF 0.6/1 KV.
- AS 3190 APPROVAL AND TEST SPECIFICATION; RESIDUAL CURRENT DEVICES (CURRENT - OPERATED EARTH - LEAKAGE DEVICES)
- AS 3760 IN SERVICE SAFETY INSPECTION AND TESTING OF ELECTRICAL EQUIPMENT.
- AS 3947 LOW VOLTAGE SWITCHGEAR AND CONTROL GEAR
- AS 4072.1 COMPONENTS FOR THE PROTECTION OF OPENINGS IN FIRE RESISTANT SEPARATING ELEMENTS - SERVICE PENETRATIONS AND CONTROL JOINTS.
- AS 4777.1 GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS - INSTALLATION REQUIREMENTS
- AS 61439 LOW-VOLTAGE SWITCHGEAR AND CONTROL GEAR ASSEMBLIES;
- AS CISPR 14.1 ELECTROMAGNETIC COMPATIBILITY - REQUIREMENTS FOR HOUSEHOLD APPLIANCES, ELECTRIC TOOLS AND SIMILAR APPARATUS
- AS CISPR 15:2002 LIMITS AND METHODS OF MEASUREMENT OF RADIO DISTURBANCE CHARACTERISTICS OF ELECTRICAL LIGHTING AND SIMILAR EQUIPMENT (CISPR 15:2000, MOD)
- AS CISPR 22:2009 INFORMATION TECHNOLOGY EQUIPMENT; RADIO DISTURBANCE CHARACTERISTICS - LIMITS AND METHODS OF MEASUREMENT
- AS S009 INSTALLATION REQUIREMENTS FOR CUSTOMER CABLING - WIRING RULES
- LOCAL ELECTRICITY SUPPLY AUTHORITY;
- WORK COVER REQUIREMENTS;
- ALL HEALTH AUTHORITY REQUIREMENTS;
- ALL LOCAL GOVERNMENT REGULATIONS;
- NSW FIRE AND RESCUE REQUIREMENTS;
- NBN CO DESIGN GUIDELINES.

### SCOPE OF WORKS

THE WORKS REQUIRED TO FULFIL THIS CONTRACT SHALL INVOLVE THE SUPPLY, INSTALLATION, TESTING, COMMISSIONING, CERTIFICATION MAINTENANCE AND WARRANTIES OF THE ELECTRICAL SERVICES / WORKS LISTED BELOW.

ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THIS SPECIFICATION. WORK IS TO BE CARRIED OUT BY ACCREDITED ENGINEERS AND TRADES PEOPLE HAVING AT LEAST FIVE YEARS' EXPERIENCE. THE INSTALLATION QUALITY SHALL BE TO INDUSTRY PRACTICE FIRST CLASS TRADES PRINCIPLES.

ALL WORK SHALL BE EQUAL TO OR BETTER THAN THE APPROPRIATE LATEST REVISION OF THE CURRENT APPLICABLE AUSTRALIAN STANDARD. ANY PROPOSAL TO INSTALL ALTERNATIVE ITEMS TO THOSE NOMINATED IN THE SPECIFICATION AND ON THE DRAWINGS SHALL BE ACCOMPANIED BY A WRITTEN CONFIRMATION BY THE MANUFACTURER THAT THE ALTERNATIVE PRODUCT MEETS THE DESIGN INTENT AND COMPLIES WITH CURRENT AUSTRALIAN STANDARDS.

WHERE DOUBTS EXIST AS TO THE APPROPRIATE STANDARD, A DECISION SHALL BE MADE BY THE PROJECT MANAGER BEFORE COMMENCEMENT OF ANY WORK ON OR OFF THE SITE. IF ANY DOUBT EXISTS AS TO WHETHER A SECTION OF THE DESIGN IS ABLE TO COMPLY WITH THE RELEVANT AUTHORITIES REGULATIONS, THE SUPERINTENDENT SHALL BE NOTIFIED PRIOR TO COMMENCEMENT OF ANY WORK. NO CONSIDERATION OF THE CLAIM FOR REDUNDANT OR ABORTIVE WORK SHALL BE GIVEN IF THE SUPERINTENDENT IS NOT NOTIFIED.

THE SCOPE OF WORK COVERED BY THIS CONTRACT INCLUDES, BUT SHALL NOT BE LIMITED TO THE FOLLOWING:

- MAIN SWITCHBOARD
- CONSUMER MAINS
- DISTRIBUTION BOARDS
- METERING
- EARTHING
- COORDINATION WITH OTHER SERVICES
- SUBMAINS MAINS
- CONDUITS FOR INCOMING POWER AND COMMUNICATIONS CABLING
- CABLE SUPPORT SYSTEMS INCLUDING TRAYS, DUCTS, CONDUITS
- LED NON-MONITORED EMERGENCY AND EXIT LIGHTING SYSTEM
- NETWORK POINTS FOR METERING OF COLD WATER AND GAS INCLUDING DATA LOGGER CABLING
- POWER TO MECHANICAL SERVICES ISOLATORS INCLUDING TERMINATION OF SUBMAINS
- NBN COMMUNICATION SYSTEM
- MATV, FREE-TO-AIR TELEVISION SYSTEMS.
- TESTING, COMMISSIONING, AND PLACING INTO WORKS THE COMPLETE ELECTRICAL INSTALLATION
- PROVISION OF ACCURATELY RECORDED "AS INSTALLED" DRAWINGS AND OPERATION AND MAINTENANCE MANUALS FOR THE COMPLETE WORKS
- PROVISION OF TWELVE (12) MONTHS WARRANTY AND COMPREHENSIVE MAINTENANCE DURING THE DEFECTS LIABILITY PERIOD. THIS INCLUDES FOR THE PROMPT RETURN TO SITE FOR RESOLUTION OF ANY PROBLEMS
- TEMPORARY BUILDER'S SUPPLIES

### EARTHING

PROVIDE A COMPLETE ELECTRICAL EARTHING SYSTEM THAT COMPRISES A NETWORK OF BONDING BETWEEN EQUIPMENT, ELECTRODES AND SERVICES MAINS. IT SHALL COMPLY WITH AS 3000 AND THE SUPPLY AUTHORITY'S REQUIREMENTS. INCORPORATE AN ADDITIONAL SEPARATE EARTHING SYSTEM TO THE STRUCTURED CABLING SYSTEM, TELEPHONE DISTRIBUTION FRAMES, ELECTRODES, ETC TO ACA STANDARD TS 009. PROVIDE EARTHING TO:

- EQUIPMENT ENCLOSURES AND DISTRIBUTION BOARD.
- METAL CONDUITS, FRAMES, CABLE TRAYS AND DUCTS.
- CABLE SHEATHS.
- METAL PIPES ENTERING OR LEAVING THE TENANCY.
- INTERNAL METAL PIPING SYSTEMS.
- METALLIC FACADE ELEMENTS.

PROVIDE STRANDED COPPER EARTHING CONDUCTORS OF ADEQUATE CROSS-SECTION, AND CONTINUOUS THROUGHOUT THEIR ENTIRE LENGTH. THEY SHALL BE GREEN/YELLOW, INSULATED TO A MINIMUM V-75 0.6/1KV RATING, AND ENCLOSED WITH A SHEATH.

SELECT ALL EARTHING CONDUCTOR SIZES IN LINE WITH AS 3000 REQUIREMENTS; CARRY OUT FAULT LOOP STUDY FOR THE FINAL CIRCUIT ARRANGEMENTS TO MEET FINAL SUBCIRCUIT AND PROTECTION PARAMETERS. EARTHING CONDUCTORS SHALL BE MINIMUM:

- 2.5mm<sup>2</sup> CROSS-SECTIONAL AREA FOR GENERAL EARTHING.
- 6mm<sup>2</sup> FOR ANY MAINS AND SUBMAINS CABLING TO DISTRIBUTION BOARDS AND CONTROL PANELS.
- 6mm<sup>2</sup> FOR ANY BONDING CONDUCTORS FOR EARTHING.

PROVIDE A MAIN EARTHING CONDUCTOR FOR THE INSTALLATION, CONNECTED TO A BOLTED, LABELLED CONNECTION ON THE EARTH ELECTRODES, AND BONDED TO THE INCOMING METALLIC SERVICES.

### ELECTRICAL SUPPLY

PROVIDE CONSUMERS MAINS FROM THE POINT OF SUPPLY TO THE MAIN SWITCHBOARD, INSTALLED IN CONDUITS UNDERGROUND AND ON CABLE TRAYS WITHIN THE BASEMENT. CO-ORDINATE ALL DETAILS OF THE INSTALLATION WITH THE SUPPLY AUTHORITY AT THE MAINS CABLE ORIGIN AND COMMISSION ALL ELECTRICAL EQUIPMENT AS REQUIRED. SUPPLY AUTHORITY IS ENDEAVOUR ENERGY.

COORDINATE ALL ACCESS REQUIREMENTS TO SUPPLY AUTHORITY EQUIPMENT AND INFRASTRUCTURE, AND PROVIDE ALL FACILITIES NECESSARY (INCLUDING ARRANGEMENTS FOR EASEMENTS, RIGHTS OF WAY, COVENANTS, ETC).

OBTAIN ALL INFORMATION FROM THE PRINCIPAL CONCERNING THE APPLICATION TO THE SUPPLY AUTHORITY, AND THE SUPPLY OFFER DETAILS, AND INCORPORATE INTO FUTURE SUBMISSIONS TO THE SUPPLY AUTHORITY; COLLATE ALL INFORMATION AND MAKE ALL APPLICATIONS NECESSARY. ENSURE THAT ELECTRIFICATION WILL BE PROVIDED BY THE SUPPLY AUTHORITY IN TIME TO MEET THE CONSTRUCTION AND COMMISSIONING PROGRAMS OF ALL PARTS OF THE INSTALLATION.

THE ELECTRICAL SUPPLY TO THE INSTALLATION WILL BE 400/230V, 4-WIRE, 3 PHASE AND NEUTRAL AND 50 HZ.

DETERMINE THE PROSPECTIVE FAULT LEVEL CURRENT AT THE INSTALLATIONS POINT OF CONNECTION AND PROVIDE EQUIPMENT AND FACILITIES SELECTED TO WITHSTAND THE FAULT LEVEL AT THE RELEVANT PARTS OF THE INSTALLATION. PROVIDE FAULT LEVEL COORDINATION THROUGHOUT THE INSTALLATION.

PROVIDE ALL METERING, INCLUDING COORDINATION OF LOCATIONS AND ACCESS NECESSARY, IN ACCORDANCE WITH THE NSW SERVICE AND INSTALLATION RULES, AND SUPPLY AUTHORITY REQUIREMENTS. METERS SHALL BE LOCATED EITHER IN THE MAIN SWITCHROOM, OR IN DEDICATED ELECTRICAL CUPBOARDS.

SATISFY ALL SUPPLY AUTHORITY ACCESS AND SIGNAGE REQUIREMENTS (INCLUDING LOCKING FACILITIES) FOR ACCESS TO ALL METERING LOCATIONS THROUGHOUT THE ACCESS ROUTE, FROM THE BUILDING ENTRANCES.

### CABLING

PROVIDE WIRING INSTALLATION COMPLETE WITH ALL SUPPORTS AND FIXINGS INCLUDING CABLE TRAYS, CONDUITS ETCETERA. UTILISE THE FOLLOWING CABLE INSTALLATION METHODS:

- GENERALLY INSTALL CABLES FULLY CONCEALED FROM VIEW, ENCLOSED IN CONDUIT CAST INTO FLOOR SLABS OR VERTICALLY IN WALLS; OR CABLES IN FALSE CEILING SPACE AND WITHIN CAVITIES.
- CAR PARKS: CONCEALED FROM VIEW, INSULATED CONDUCTORS ENCLOSED IN CONDUIT CAST INTO CONCRETE FLOOR/CEILING SLABS OR ON CABLE TRAY.
- FACADES: UTILISE BRASS OR COPPER CONDUITS, AND FIXINGS IN METHODS TO APPROVAL, FOR ALL AREAS WHETHER HERITAGE OR NOT.
- STAIRS: FULLY CONCEALED FROM VIEW, INSULATED CONDUCTORS ENCLOSED WITHIN CONDUIT CAST INTO THE WALL/CEILING SLABS.

UTILISE SINGLE INSULATED CONDUCTORS ENCLOSED WITHIN CONDUITS OR WIRING DUCTS, INSTALLED ON THE LOOP-IN SYSTEM WITHOUT THE USE OF CONNECTORS AND JOINED, ONLY AT OUTLET OR SWITCH POSITIONS.

UTILISE INSULATED AND SHEATHED CONDUCTORS WITHIN CONCEALED CONDUIT WHERE RUN IN RENDERED WALLS OR CONCRETE. INSULATED AND SHEATHED CONDUCTORS SHALL NOT BE INSTALLED IN LOCATIONS WHERE THEY CANNOT EASILY BE WITHDRAWN FOR REWIRING PURPOSES.

### CABLING SUPPORT

PROVIDE CABLE TRAYS AND LADDERS TO SUPPORT MULTIPLE RUNS OF CABLING. CABLE SUPPORTS SHALL:

- BE SIZED WITH MINIMUM 25% SPARE CAPACITY SO THAT IT IS LOADED TO NO MORE THAN 75% OF ITS WIDTH (INCLUDING SPACES BETWEEN CABLES FOR DE-RATING PURPOSES).
- HAVE A CORROSION RESISTANT FINISH, PRESSED AND FOLDED ZINCALUME OR GALVANISED SHEET STEEL.
- BE FITTED WITH THE MANUFACTURER'S STANDARD BENDS, RISERS, CURVES, REDUCERS AND FISHPLATES.
- BE FIXED TO APPROVED GALVANISED STEEL BRACKETS AND HANGERS, EXCEPT WHERE INSTALLED VERTICALLY ON A CONTINUOUS WALL.
- BE FIXED SUCH THAT THERE IS AN AIR SPACE OF 50mm MINIMUM TO THE STRUCTURE TO WHICH IT IS SECURED.
- BE SUPPORTED SUCH THAT THE MAXIMUM DEFLECTION UNDER BEARING FULL LOAD, BETWEEN SUPPORTS, DOES NOT EXCEED 5mm.
- BE SUPPORTED WITH BOOKER RODS TO MITIGATE TRAY/LADDER DEFLECTION IN ANY PLANE.
- BE INSTALLED PARALLEL OR AT RIGHT ANGLES TO THE BUILDING STRUCTURE AND PLANNING GRIDS.
- HAVE MINIMUM OF 200mm CLEARANCE BETWEEN BOTTOM OF CABLE TRAY SUPPORT BRACKET AND THE TOP OF CEILING TILE.
- BE SECURED TO WALLS AND CEILING WITH BRACKETS OF APPROVED DESIGN, SO AS TO SUPPORT TRAYS IN A STRAIGHT AND TRUE LINE.
- BE EARTHED WITH EQUIPOTENTIAL BONDING ALONG THE LENGTH OF THE CABLE LADDER/TRAY, PROVIDE PLATES AND COMPRESSION BOLTS/WASHERS, OR CABLE STRAPS BETWEEN SECTIONS.
- BE HOT DIPPED GALVANISED, EQUAL TO UNISTRUT OR EQUIVALENT.

### MAIN SWITCHBOARD

PROVIDE THE MAIN SWITCHBOARD WITHIN A MAIN SWITCH ROOM TO SERVICE THE ENTIRE DEVELOPMENT. PROVIDE SEGREGATION BETWEEN HOUSE AREA SERVICES AND RESIDENTIAL SERVICES SECTIONS.

UNLESS DOCUMENTED OTHERWISE ON THE ELECTRICAL SERVICES DRAWINGS, MAIN SWITCHBOARD SHALL BE A MINIMUM OF FORM 2BI, 15kA FAULT CURRENT RATING AND IP65 PROTECTION.

PROVIDE THE MAIN SWITCHBOARD SERVICE PROTECTIVE DEVICE WITH ELECTRONIC TRIP UNIT (COMPLETE WITH LOCKING AND SEALING FACILITIES), SUPPLY AUTHORITY METERING EQUIPMENT AND SWITCHGEAR.

THE MAIN SWITCHBOARD SHALL BE UNITARY FOLDED AND WELDED CONSTRUCTION, AND FABRICATED FROM MINIMUM 2mm STEEL. IT SHALL CONTAIN AN OPEN BASE AND A WIRING COMPARTMENT WITH COVER PANE, FOR ACCESS TO CABLES AND CONDUITS WHICH PASS THROUGH THE BASE OF THE SWITCHBOARD.

PROVIDE A SUPPORTING BASE FRAME FORMED FROM GALVANISED CHANNEL SECTIONS, 75mm HIGH, AND A FULL COMPLEMENT OF CONDUIT KNOCKOUTS IN A REMOVABLE COVER PLATE AT THE TOP AND BOTTOM OF THE ENCLOSURE.

LOAD CENTRE RESIDENTIAL DISTRIBUTION BOARDS UNLESS DOCUMENTED OTHERWISE ON THE ELECTRICAL SERVICES DRAWINGS, DISTRIBUTION BOARDS SHALL BE THREE PHASE, A MINIMUM OF FORM 1, 6kA FAULT CURRENT RATING, 12 POLES, IP42 PROTECTION AND HAVE A CURRENT RATING OF 32 AMPS.

PROVIDE CHASSIS WITH A MINIMUM OF 20% SPARE SPACE REMAINING IN ALL DISTRIBUTION BOARDS AFTER COMPLETION OF THE WORKS.

DISTRIBUTION BOARDS SHALL BE DEAD FRONT TOTALLY ENCLOSED WITH FRONT CONNECTED MINIATURE CIRCUIT BREAKERS AND A MAIN SWITCH. PROVIDE SUITABLE DISCRIMINATION AND CASCADE TO MAIN SWITCH, TO MEET FAULT LEVEL OR PROTECTION REQUIREMENTS.

### NBN

#### GENERAL

PROVIDE A COMPLETE CABLING SYSTEM THROUGHOUT THE BUILDING COMPLIANT TO THE NBN CO STANDARDS. ENSURE NBN CO'S SPATIAL AND ENVIRONMENTAL REQUIREMENTS, FOR EQUIPMENT WITHIN PREMISES, ARE COMPLIED WITH THROUGHOUT THE INSTALLATION.

PROVIDE A MANUFACTURER'S WARRANTY (10 YEARS MINIMUM) FOR THE SYSTEM AND FULLY DETAILED AS INSTALLED DRAWINGS PRIOR TO PRACTICAL COMPLETION.

#### RESPONSIBILITIES

PROVIDE:

- THE SERVICE DROP CONDUITS (P50 (Ø50mm)) WHITE RIGID COMMUNICATIONS (CONDUITS) FROM NOMINATED TELECOMMUNICATIONS PIT ON THE STREET TO THE BUILDING FIBRE DEVICE (BFD), IN THIS INSTANCE, A BUDI-M.
- WHITE 25mm RIGID COMMUNICATIONS CONDUIT (CAST IN SLAB AS REQUIRED), DOUBLE 10A SOCKET OUTLET (AT EACH NTD LOCATION), OUTLET TO BE POSITIONED MAXIMUM 200mm AWAY FROM NBN EQUIPMENT.
- 8 PORT PATCH PANEL AT EACH NTD LOCATION.
- SPACE AND SHELF FOR AN ISP LOCATION.
- STAR-WIRED CAT 6 STRUCTURED CABLING THAT IS TERMINATED AT THE NTD PATCH PANEL.

NBN EQUIPMENT IS TO BE INDICATED)

NBN CO INSTALLS THE:

- SERVICE DROP CABLE FROM THE STREET TO THE BUILDING FIBRE DEVICE (BFD).
- PREMISES CABLES FROM THE BFD TO THE NTDs; USING WHITE PREMISE FIBRES.

### CIRCUITING

DETERMINE THE FINAL CIRCUITING AND SUBCIRCUITING ARRANGEMENTS FOR THE INSTALLATION CONSIDERING SITE SPECIFIC CONSTRAINTS FOR WIRING, AND DESIGN DRAWINGS INFORMATION FOR SUBCIRCUITING. ENSURE THAT CIRCUIT NUMBERS ARE CONFIRMED PRIOR TO COMPLETING DESIGN OF DISTRIBUTION BOARDS; ENSURE SWITCHBOARDS ARE CONFIGURED TO ACCOMMODATE FINAL CIRCUITING ARRANGEMENTS.

CONFIRM THE NUMBERS, LOCATIONS, AND DETAILS OF ALL OUTLETS. CONFIRM SUPPLIED EQUIPMENT NAMEPLATE RATINGS, CIRCUIT PHASE REQUIREMENTS, EXACT LOCATIONS AND CONNECTION TYPE, PRIOR TO ARRANGING CIRCUITING. ARRANGE SUBCIRCUITS TO MEET ALL VOLTAGE DROP, FAULT LOOP AND CURRENT CARRYING CAPACITIES AS SPECIFIED BY AS 3000; AND INCORPORATE INTEGRAL EARTH LEAKAGE PROTECTION WHERE REQUIRED. ARRANGE SUBCIRCUITS AS FOLLOWS:

- SEPARATE SUBCIRCUITS FOR LIGHTING AND POWER, AND DEDICATED OR FIXED EQUIPMENT.
- PROVIDE 20A RATED CIRCUIT BREAKER FOR LIGHTING SUBCIRCUITS WITH NUMBER OF FITTINGS LIMITED TO NOT EXCEED CONNECTED LOAD UTILISATION OF 60% (BASED ON FULL CONNECTED LIGHTING LOAD) OR MAXIMUM 50% LEAKAGE CURRENT.
- PROVIDE NO MORE THAN 20 LUMINAIRES PER CIRCUIT.
- 20A RATED CIRCUIT BREAKERS FOR GENERAL PURPOSE POWER SUBCIRCUITS.
- ARRANGE CIRCUITS AS PER THE DETAILS ON THE SINGLE LINE DIAGRAMS.
- PROVIDE NO MORE THAN EIGHT DOUBLE 10A SWITCHED SOCKET OUTLETS PER CIRCUIT.
- PROVIDE A DEDICATED CIRCUIT FOR EACH 15A OR 20A OUTLET.
- PROVIDE A DEDICATED CIRCUIT FOR EACH 3 PHASE OUTLET OR PERMANENTLY CONNECTED EQUIPMENT.
- ARRANGE CIRCUITS TO AVOID CONNECTED EQUIPMENT INTERFERENCE BETWEEN APPLIANCES DUE TO FIXED WIRING INSTALLATION.
- ARRANGE NUMBERS OF FIXINGS/OUTLETS/EQUIPMENT CIRCUITED TO NOT CAUSE SPURIOUS TRIPPING WITH USAGE UNDER LOADS.
- PROVIDE DEDICATED CIRCUIT FOR GAS AND WATER METERING OUTLETS.
- PROVIDE CIRCUITS FOR NBN, MATV AND COMMUNICATIONS EQUIPMENT, AS REQUIRED.
- SELECT CONDUCTOR SIZE TO SUIT LOAD, VOLTAGE DROP AND FAULT LOOP IMPEDANCE FOR PROTECTIVE CIRCUIT.

SELECT ALL CONDUCTORS TO LIMIT VOLTAGE DROP TO A MAXIMUM OF 5% OF THE DESIGNATED SUPPLY VOLTAGE TO ANY FINAL OUTLET ON THE SYSTEM, UNDER CALCULATED MAXIMUM DEMAND LOAD CONDITIONS, WITH AN ALLOWANCE OF MAXIMUM 1.5% OF THE TOTAL VOLTAGE DROP THROUGH THE FINAL SUBCIRCUIT TO THE FARTHEST CONNECTED OUTLET.

#### EMERGENCY AND EXIT LIGHTING

PROVIDE A COMPLETE EMERGENCY AND EXIT LIGHTING SYSTEM THROUGHOUT THE DEVELOPMENT AS PER THE REQUIREMENTS OF THE NCC AND AS 2293, USING EMERGENCY LUMINAIRES AND EXIT SIGNS WITH INTEGRAL BATTERIES AND CHARGERS.

ALL EMERGENCY LUMINAIRES AND ILLUMINATED EXIT SIGNS SHALL BE:

- LED.
- OF THE SELF-CONTAINED TYPE.
- CLASSIFIED IN ACCORDANCE WITH AS 2293, WITH THE CLASSIFICATION MARKED ON THE LUMINAIRE LABEL.
- WITH LITHIUM TECHNOLOGY BATTERIES.

ALL EMERGENCY LUMINAIRES AND ILLUMINATED EXIT SIGNS SHALL:

- BE OF THE SELF-CONTAINED NON-MAINTAINED TYPE.
- CONTAIN A MAINS FAILURE RELAY.
- SECURELY FASTENED IN POSITION WITH PURPOSE MADE CLAMPS SEPARATELY HOUSED IN A BATTERY PACK.
- BE LOCATED CLEAR OF ANY HEAT SOURCE.
- BE POSITIONED TO PERMIT REMOVAL AND REPLACEMENT WITHOUT REMOVING OTHER COMPONENTS, AND WITH THE LUMINAIRE MOUNTED IN POSITION.
- HAVE REVERSE BATTERY POLARITY PROTECTION.
- BE PROVIDED WITH AN INTEGRAL TEST SWITCH TO SIMULATE MAINS FAILURE.
- HAVE A CHARGE INDICATOR LED SHOWING MAINS SUPPLY AVAILABLE AND CHARGING CIRCUIT STATUS.
- BE ADEQUATELY VENTILATED.
- INCLUDE INTEGRAL BATTERIES, INVERTER, CHARGER AND CHANGE-OVER DEVICE.
- BE DESIGNED FOR A 10 YEAR EXPECTED LIFETIME INCLUDING THE DRIVER AND THE LEDS.
- HAVE A GUARANTEED LIFE OF 4 YEARS WHEN OPERATED IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS.
- BE CLASSIFIED IN ACCORDANCE WITH AS 2293. THE CLASSIFICATION SHALL BE CLEARLY MARKED ON THE LUMINAIRE LABEL.
- BE TESTED IN ACCORDANCE WITH AS 2293 WITH RESPECT TO THERMAL/DURATION, AND PHOTOMETRY RESULTING IN A CLASSIFICATION.



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**100%  
ISSUE**

## ELECTRICAL SERVICES

Project North

Client: VINCENT JARVIS  
Architect:

Project Number: 24071  
Drawing Number: E001  
Revision: P1

Drawn by: HR  
Designed by: GA  
Approved by: LR  
Scale: NTS

NEW WAREHOUSE, 39 CERES  
DRIVE, THURGOONA, NSW, 2640

### ELECTRICAL SPECIFICATIONS



Sydney: (02) 9052 6460  
Newcastle: (02) 9052 6461



**Sydney:** Suite 1, 401 Pacific Hwy  
Artarmon, NSW 2064  
**Newcastle:** Suite 4, 102 Glebe Road  
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## ELECTRICAL SERVICES

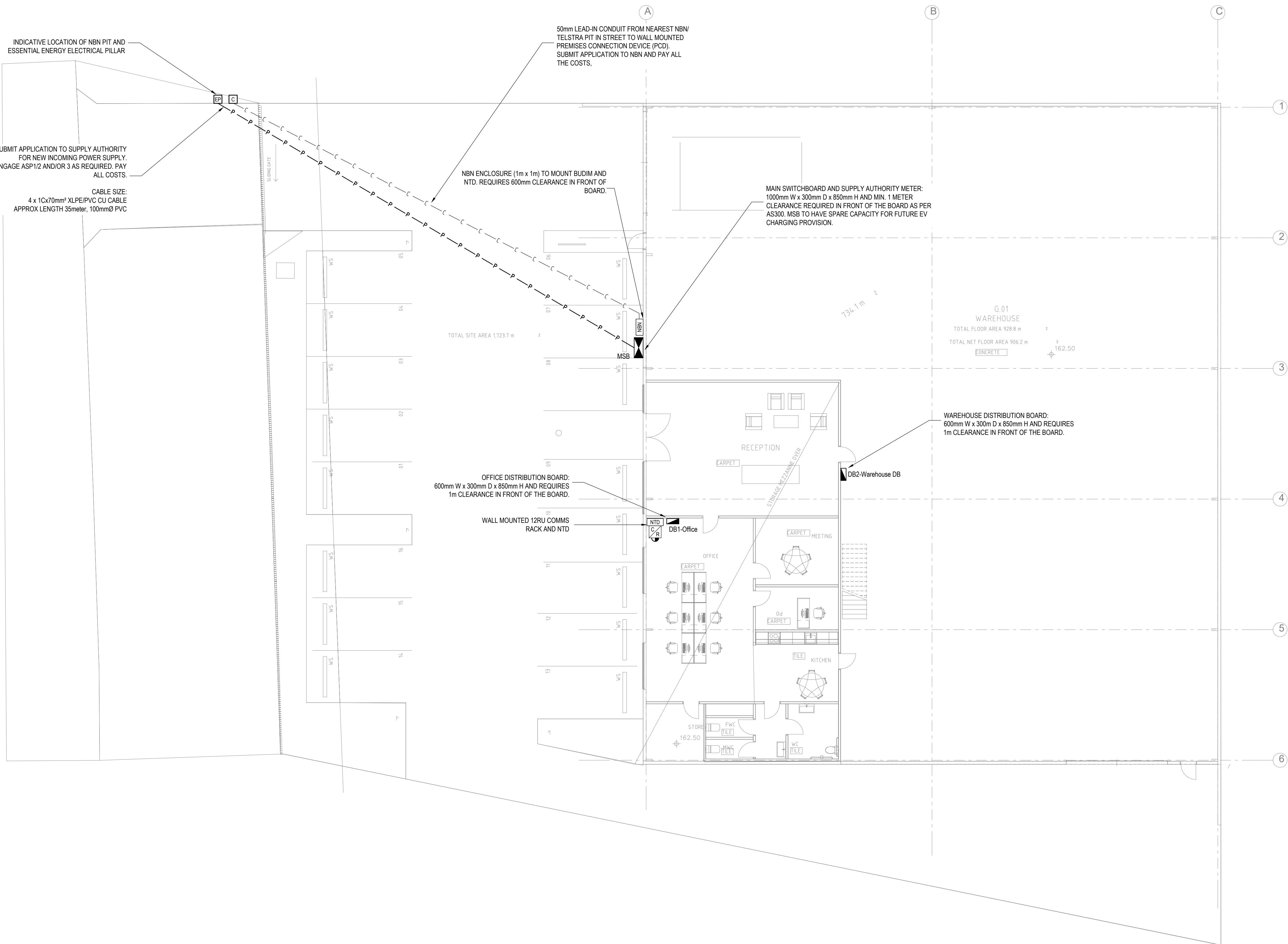
Project North



Client: VINCENT JARVIS  
Architect:  
Project Number: 24071  
Drawing Number: E002  
Revision: P1  
Drawn by: HR  
Designed by: GA  
Approved by: LR  
Scale: 1:100 @ A1

NEW WAREHOUSE, 39 CERES  
DRIVE, THURGOONA, NSW.2640

SITE PLAN



Sydney: (02) 9052 6460  
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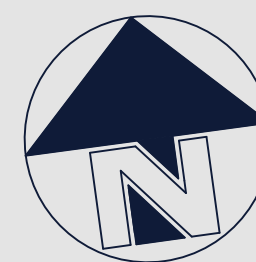
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ISSUE**

**ELECTRICAL  
SERVICES**

Project North



Client: VINCENT JARVIS  
Project Number: 24071  
Drawing Number: E100  
Revision: P1  
Drawn by: HR  
Designed by: GA  
Approved by: LR  
Scale: 1:100 @ A1

NEW WAREHOUSE, 39 CERES  
DRIVE, THRUOGOONA, NSW.2640

LEVEL G FLOOR PLAN &  
COMMUNICATIONS LAYOUT



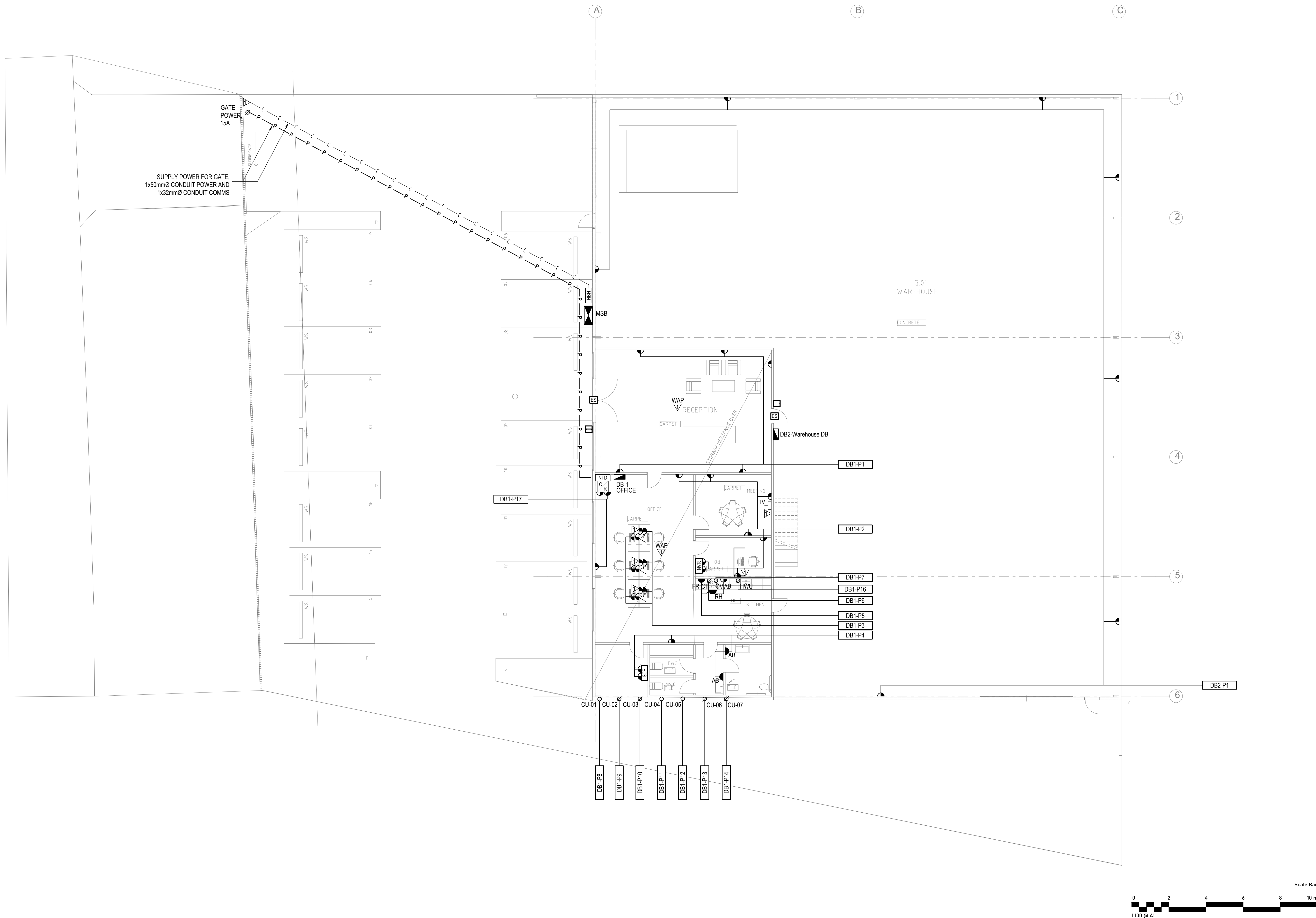
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ISSUE**

**ELECTRICAL  
SERVICES**

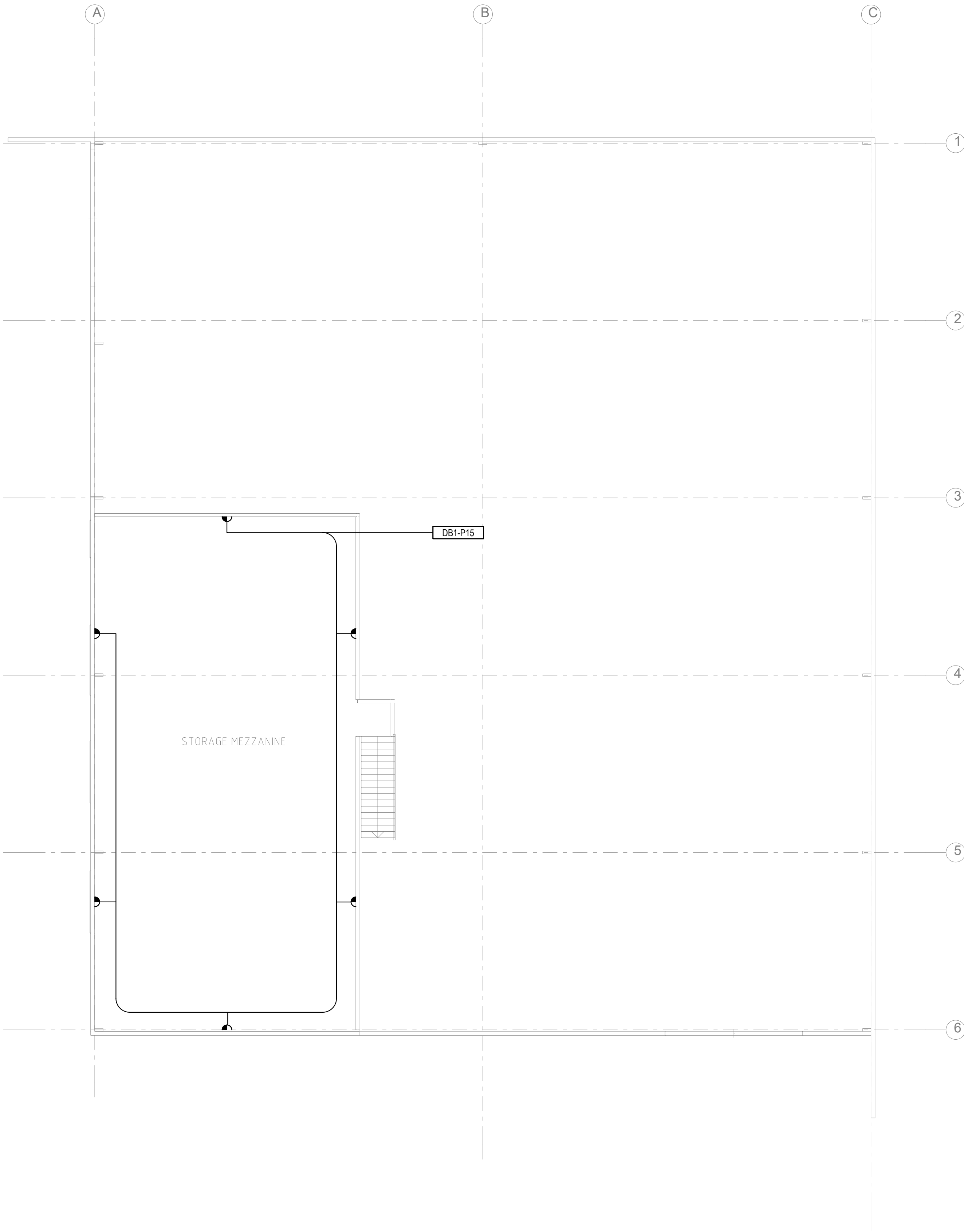
Project North



Client:  
Architect: VINCENT JARVIS  
Project Number: 24071  
Drawing Number: E101  
Revision: P1  
Drawn by: HR  
Designed by: GA  
Approved by: LR  
Scale: 1:100 @ A1

NEW WAREHOUSE, 39 CERES  
DRIVE, THRUGOONA, NSW,2640

LEVEL M FLOOR PLAN POWER &  
COMMUNICATIONS LAYOUT



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ISSUE**

## ELECTRICAL SERVICES

Project North



Client: VINCENT JARVIS  
Architect:

Project Number: 24071  
Drawing Number: E200  
Revision: P1

Drawn by: HR  
Designed by: GA  
Approved by: LR  
Scale: 1:100 @ A1

NEW WAREHOUSE, 39 CERES  
DRIVE, THRUGOONA, NSW,2640

LEVEL G FLOOR PLAN LIGHTING  
LAYOUT



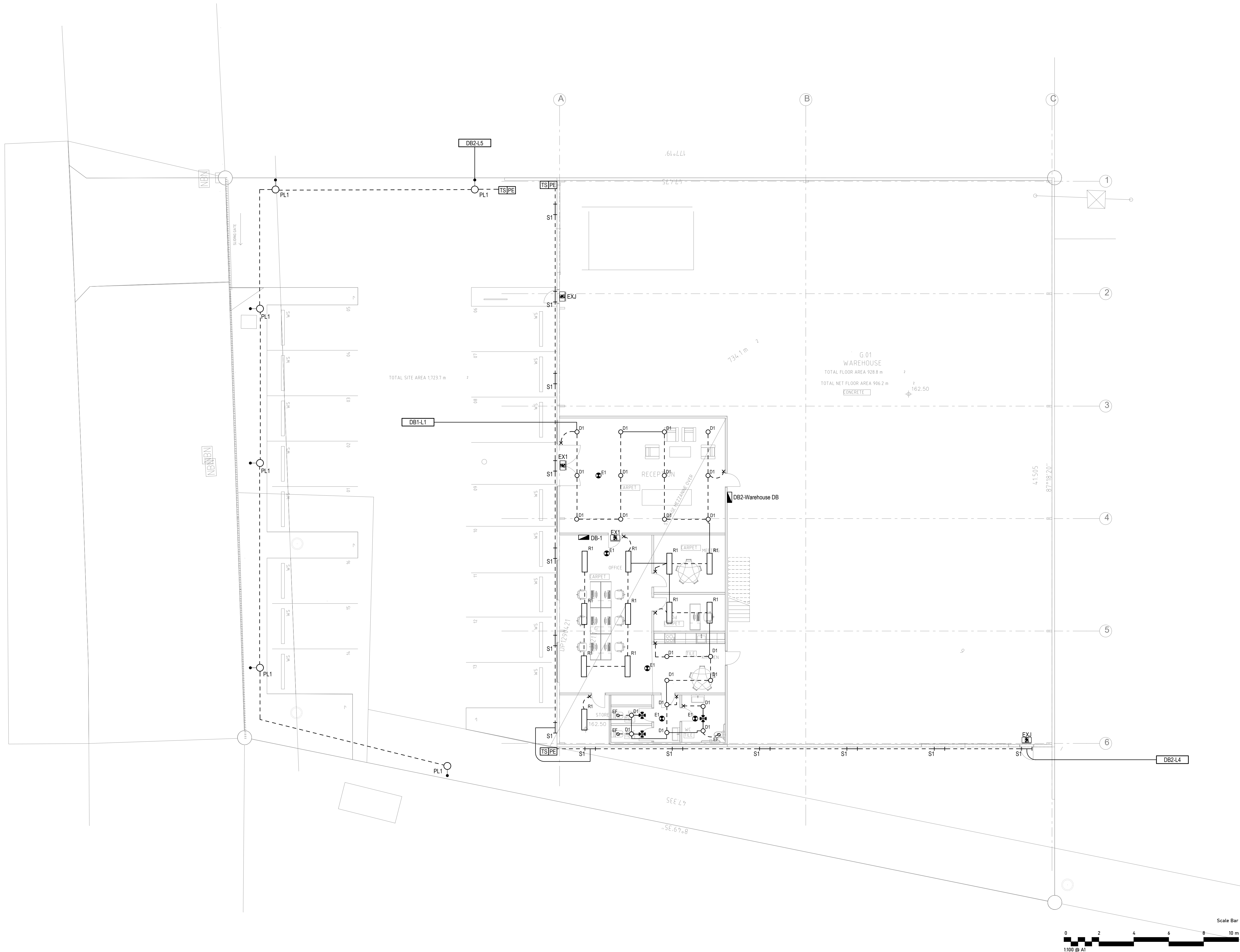
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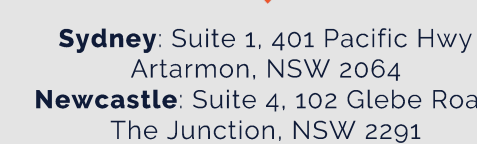
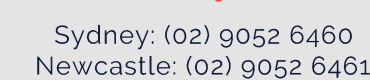
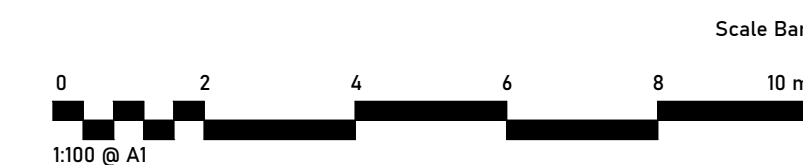


P1	10.04.2025	100% DD ISSUE
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## ELECTRICAL SERVICES

Drawn by: HR  
Designed by: GA  
Approved by: LR  
Scale: 1:100 @ A1

### LEVEL M FLOOR PLAN LIGHTING LAYOUT





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ISSUE**

**ELECTRICAL  
SERVICES**

Project North

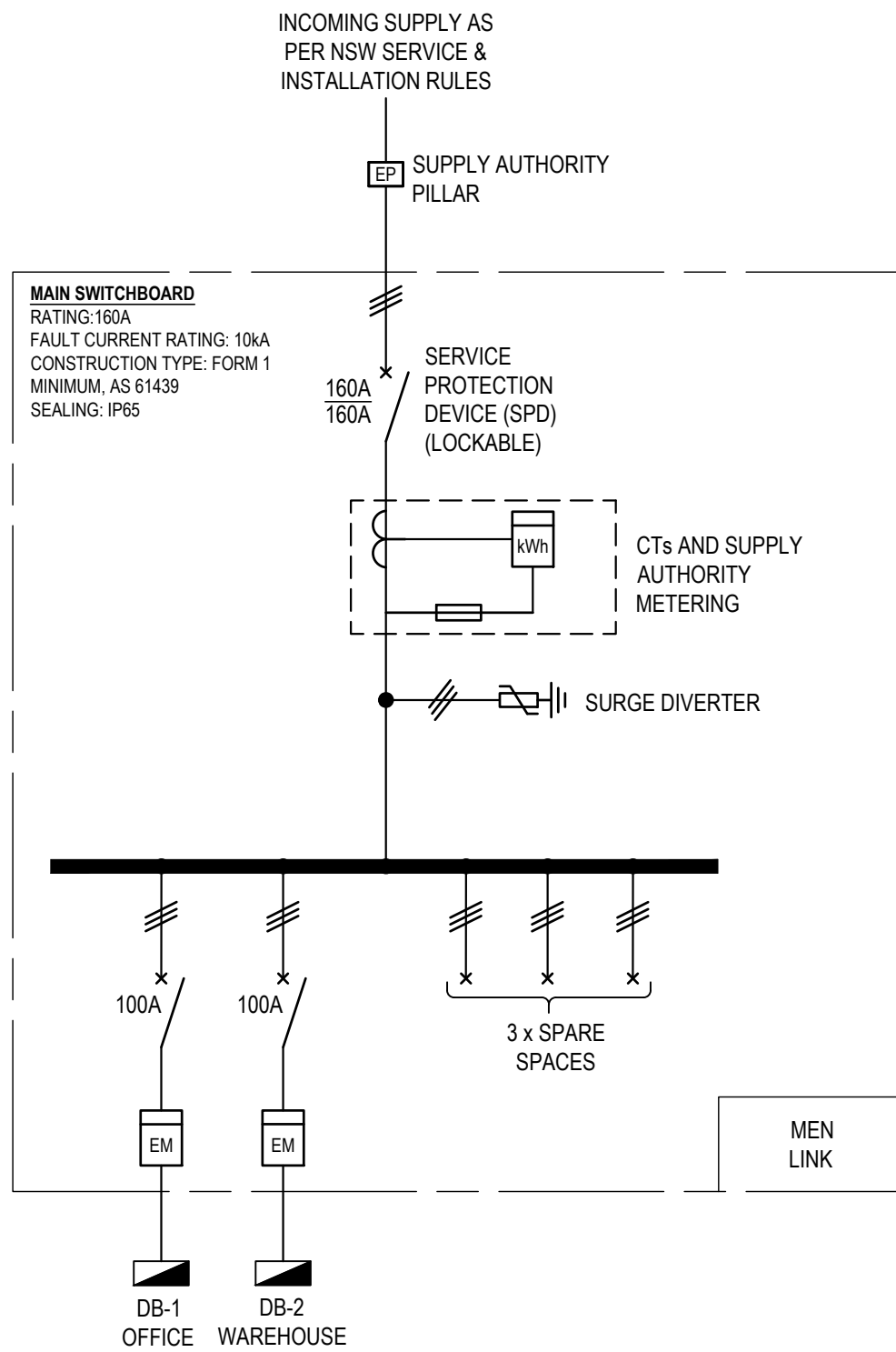
Client: VINCENT JARVIS  
Architect:

Project Number: 24071  
Drawing Number: E300  
Revision: P1

Drawn by: HR  
Designed by: GA  
Approved by: LR  
Scale: N.T.S

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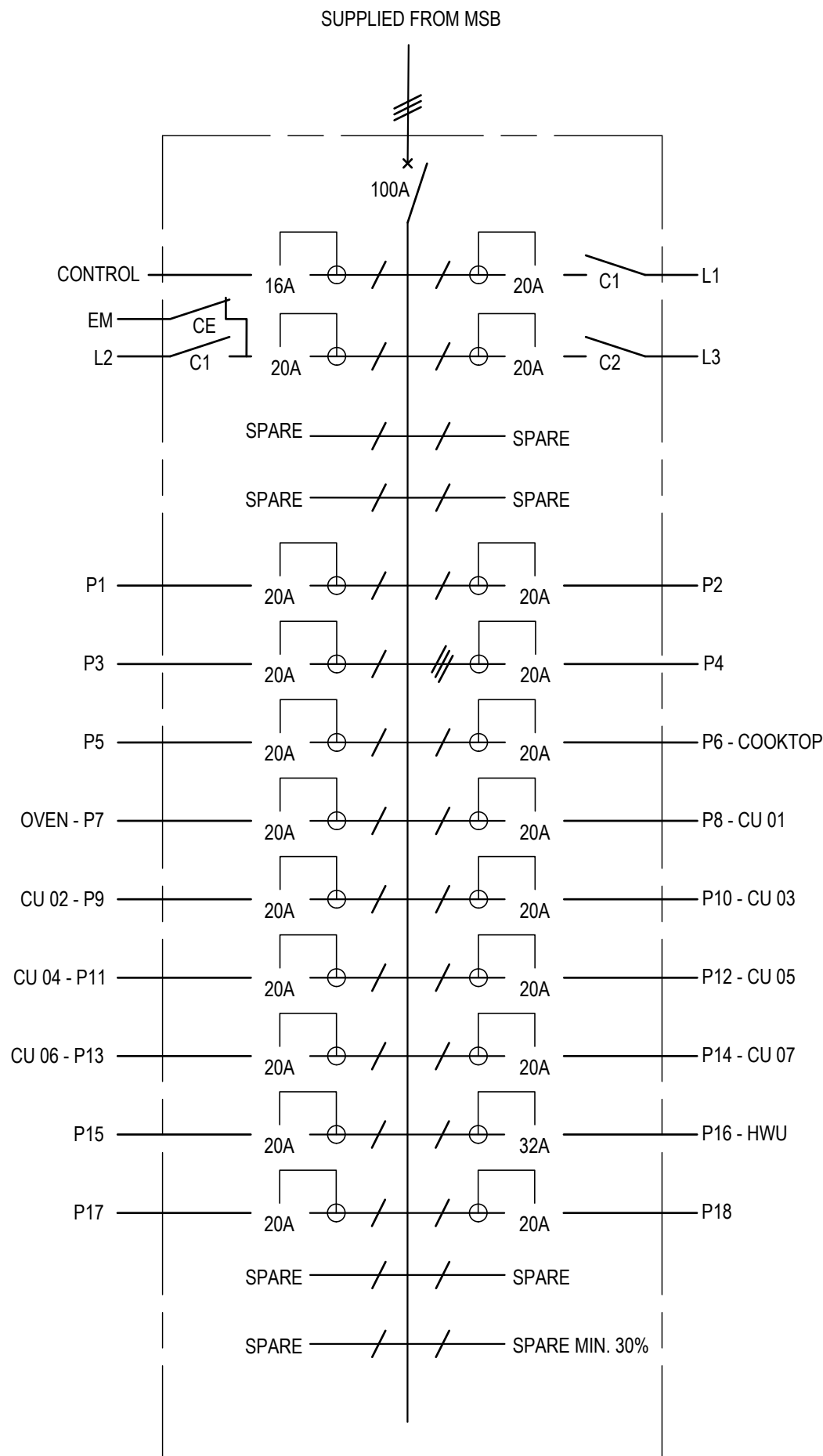
ELECTRICAL SCHEMATIC



**MAIN SWITCH BOARD (MSB)**

**GENERAL NOTES**

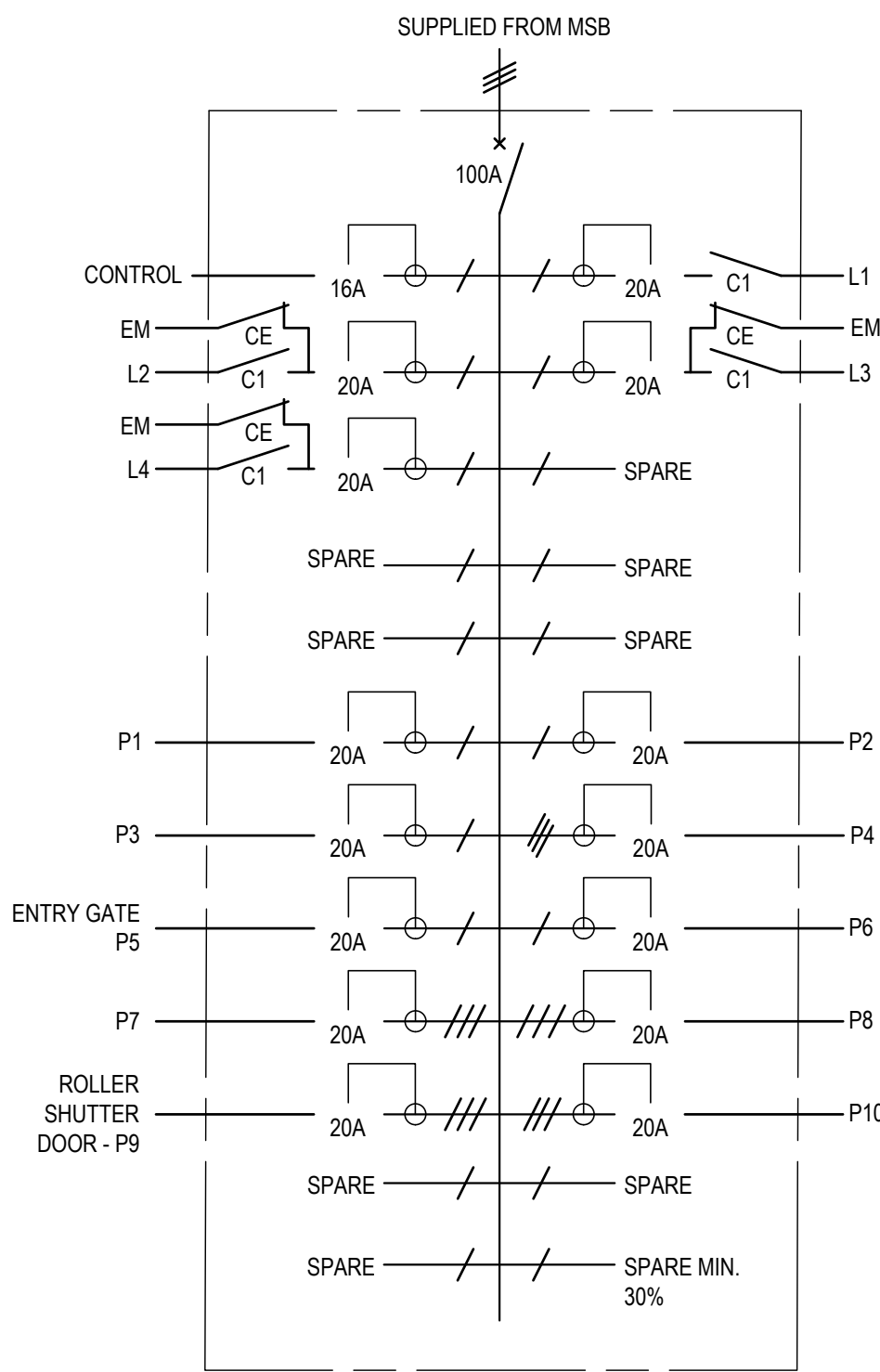
- PROVIDE ALL NEW MAIN AND SUB DISTRIBUTION BOARDS IN ACCORDANCE WITH THE CONTRACT DOCUMENTATION AND AS/NZS 61439.
- SUBMIT WORKSHOP DRAWINGS OF ALL MAIN SWITCHBOARD AND DISTRIBUTION BOARDS FOR APPROVAL PRIOR TO MANUFACTURING.
- SWITCHBOARD TO BE SIZED AND CO-ORDINATED TO ENSURE CLEARANCES ARE ACHIEVED IN ACCORDANCE WITH AS3000:2018
- SWITCHBOARDS ARE TO BE OF FOLDED AND WELDED CONSTRUCTION OF 1.6mm ZIC-ANNEALED STEEL IN THE NOMINATED FORM AND IP RATING. SWITCHBOARD TO BE ELECTRIC ORANGE FINISH - FINAL COLOURS TO BE AGREED WITH ARCHITECT / PROJECT MANAGEMENT.
- AUTOMATIC PROTECTION DEVICES SHALL BE CO-ORDINATED SO AS THAT A FAULT APPEARING AT A GIVEN POINT IN THE NETWORK IS CLEARED BY THE PROTECTIVE DEVICE INSTALLED IMMEDIATELY UPSTREAM OF THE FAULT AND BY THAT DEVICE ALONE.
- WHERE BREAKING CAPACITY OF THE DEVICE IS LESS THAN THE PROSPECTIVE SHORT CIRCUIT CURRENT AT THAT POINT THEN THE LET THROUGH ENERGY OF THE UPSTREAM DEVICE SHALL NOT BE GREATER THAN THAT WHICH CAN BE WITHSTOOD BY THE DOWNSTREAM DEVICE.
- SWITCHBOARDS SHALL BE CONFIGURED SO AS TO BE ACCOMMODATE WITH SPACES ALLOCATED. THE CONTRACTOR SHALL FAMILIARISE THEM SELF WITH ALL SPACES AVAILABLE AND MAKE ALLOWANCES IN THE TENDER TO CUSTOM MANUFACTURE SWITCHBOARDS SO AS THEY CAN BE ACCOMMODATED WITHIN SPACES AVAILABLE.
- PROVIDE TRAFFOLYTE IDENTIFICATION LABELS DISPLAYING THE FOLLOWING INFORMATION IN BLACK LETTERS ON WHITE BACKGROUND.
  - FAULT RATING AND PROSPECTIVE FAULT LEVEL
  - SUPPLY SIZE, LENGTH AND ORIGIN
  - IP AND CURRENT RATING
  - MANUFACTURER DETAILS
- PROVIDE SUITABLE LABELING TO COMPLY WITH THE LOCAL AND SUPPLY AUTHORITY ENERGY REQUIREMENTS.
- CO-ORDINATE LOCATION OF CONDUITS AND SWITCHBOARD WITH STRUCTURE, STORMWATER, HYDRAULIC AND MAIN SWITCHBOARD LAYOUT.
- ALL CABLES INSTALLED SO CABLE GROUPING DERATING CAN BE AVOIDED TO AS3008.
- SWITCHBOARD SHALL BE SUITABLY ANCHORED WITH LIMITED MOVEMENT.
- PROVIDE SURGE PROTECTION ON EACH PHASE AND NEUTRAL AS SPECIFIED. SURGE DIVERTERS AND AND ASSOCIATED EQUIPMENT TO BE IN ACCORDANCE WITH MANUFACTURERS GUIDELINES.



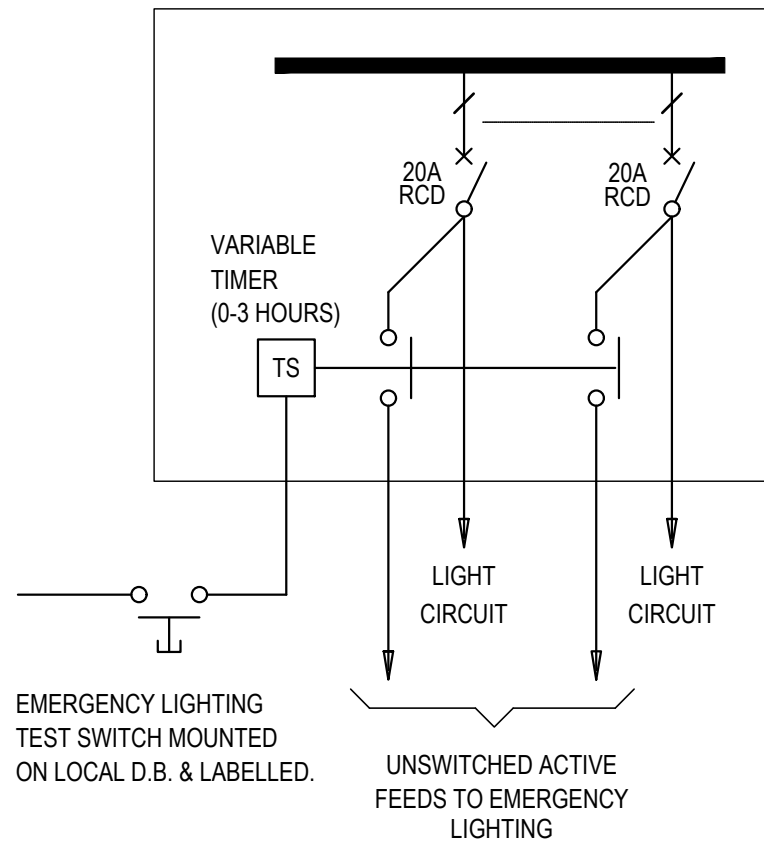
**DISTRIBUTION BOARD  
(DB-1)**

**DISTRIBUTION BOARD NOTES:**

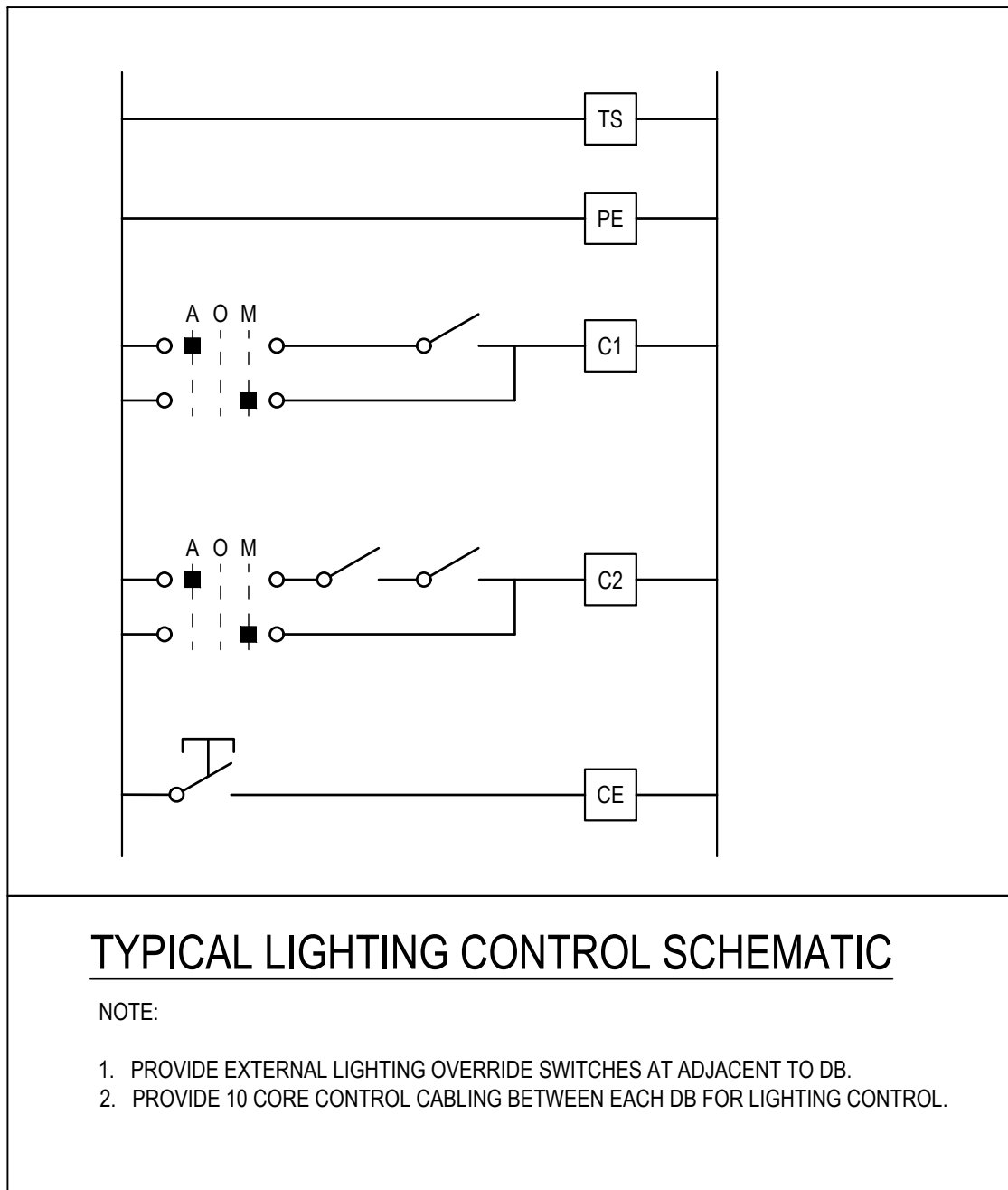
- NEW DISTRIBUTION BOARD TO BE WALL MOUNTED AND TO BE SIZED & CO-ORDINATED TO ENSURE CLEARANCES ARE MAINTAINED IN ACCORDANCE WITH AS/NZS 3000:2018.
- PROVIDE ISOLATORS FOR EQUIPMENT PROVIDED BY OTHERS. CO-ORDINATE FINAL LOCATION WITH OTHER TRADES.
- RATINGS AND TERMINATIONS OF ALL EQUIPMENT TO BE CONFIRMED WITH SUPPLIER/MANUFACTURER'S RECOMMENDATIONS PRIOR TO INSTALLATION.
- ALL CIRCUITS ARE TO BE PROVIDED WITH RCD PROTECTION IN ACCORDANCE WITH AS/NZS3000:2018.
- CIRCUITS ARE SHOWN INDICATIVE ONLY - FINAL CIRCUIT ARRANGEMENT TO BE CONFIRMED ON SITE AND DOCUMENTED IN AS-BUILT DOCUMENTATION.



**DISTRIBUTION BOARD  
(DB-2)**



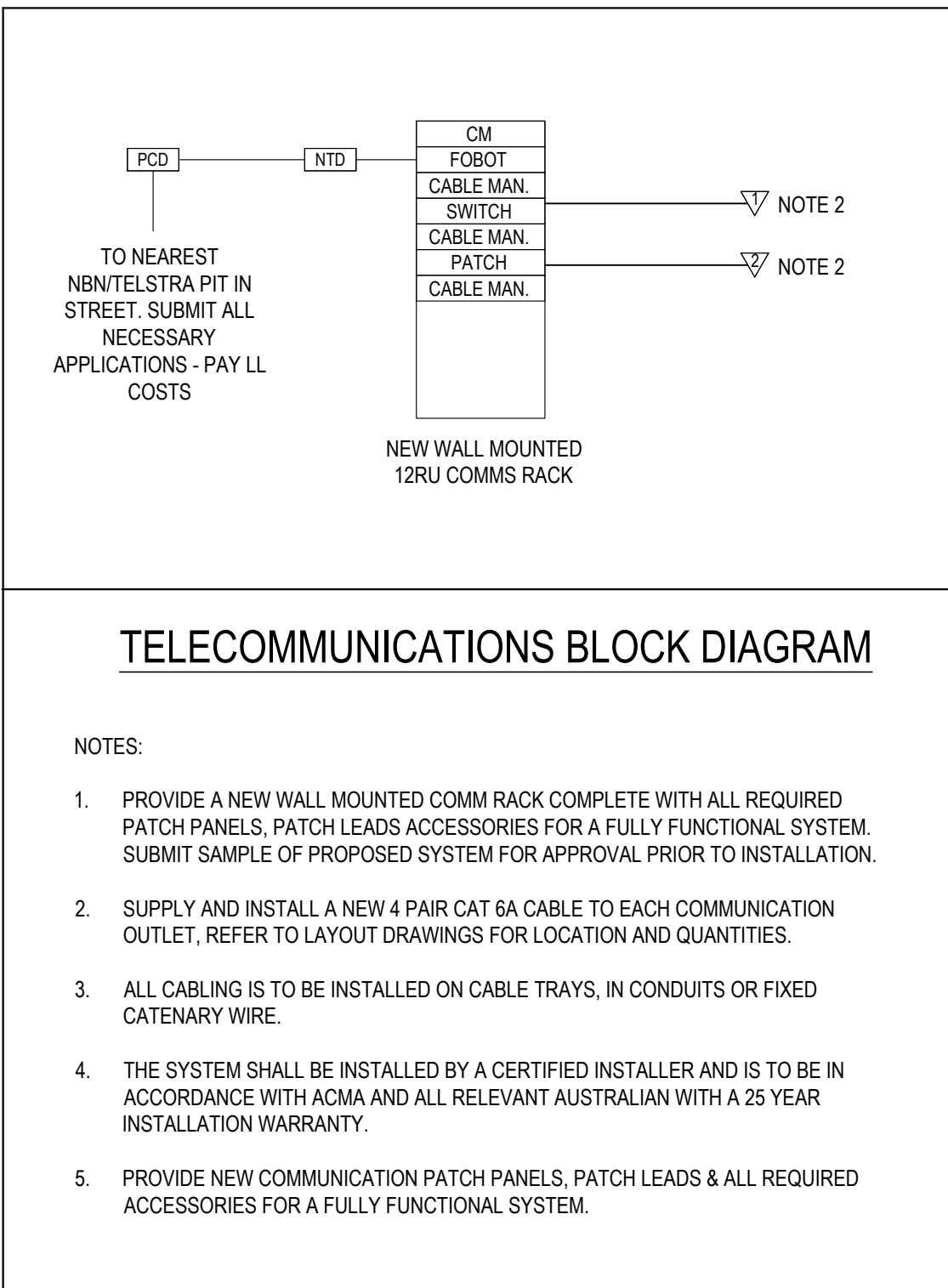
**TYPICAL EMERGENCY LIGHTING  
TEST CIRCUIT SCHEMATIC**



**TYPICAL LIGHTING CONTROL SCHEMATIC**

NOTE:

- PROVIDE EXTERNAL LIGHTING OVERRIDE SWITCHES AT ADJACENT TO DB.
- PROVIDE 10 CORE CONTROL CABLING BETWEEN EACH DB FOR LIGHTING CONTROL.



**TELECOMMUNICATIONS BLOCK DIAGRAM**

NOTES:

- PROVIDE A NEW WALL MOUNTED COMM RACK COMPLETE WITH ALL REQUIRED PATCH PANELS, PATCH LEADS ACCESSORIES FOR A FULLY FUNCTIONAL SYSTEM. SUBMIT SAMPLE OF PROPOSED SYSTEM FOR APPROVAL PRIOR TO INSTALLATION.
- SUPPLY AND INSTALL A NEW 4 PAIR CAT 6A CABLE TO EACH COMMUNICATION OUTLET, REFER TO LAYOUT DRAWINGS FOR LOCATION AND QUANTITIES.
- ALL CABLING IS TO BE INSTALLED ON CABLE TRAYS, IN CONDUITS OR FIXED CATENARY WIRE.
- THE SYSTEM SHALL BE INSTALLED BY A CERTIFIED INSTALLER AND IS TO BE IN ACCORDANCE WITH ACMA AND ALL RELEVANT AUSTRALIAN WITH A 25 YEAR INSTALLATION WARRANTY.
- PROVIDE NEW COMMUNICATION PATCH PANELS, PATCH LEADS & ALL REQUIRED ACCESSORIES FOR A FULLY FUNCTIONAL SYSTEM.



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## DOCUMENT REGISTER & TRANSMITTAL NOTICE



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[info@centricengineers.com.au](mailto:info@centricengineers.com.au)  
[www.centricengineers.com.au](http://www.centricengineers.com.au)

**Job Title: NEW WAREHOUSE**  
**Address: 39 CERES DRIVE THRUGOONA NSW 2640**  
**Job No: 24071**  
**Discipline: Electrical**

[illegible]