

WOOLWORTHS GROUP



INFORMATION TECHNOLOGY

Stores Structured Cabling System Specification

Applicable for Use in All Retail Stores

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LIST OF CHANGES

Section	Description
All	Overrides previous released specifications, named; <ul style="list-style-type: none">- Supermarket SCS Specification 2018- Dan Murphys SCS Specification 2019- Big W SCS Specification 2019- Metro SCS Specification 2017
All	Changed formatting/design based on Infrastructure Standards template
4.1.2	Added earthing scope, to align with F/UTP earthing of panels requirement.
4.1.3	CAT6 U/UTP to CAT6A F/UTP products changed, based on recommendations in standard ' AS 11801.6:2019 Distributed Building Generic Cabling 11801-3'
4.1.3	Note that a copper backbone is no longer required between the BD and FD.
4.1.3	Fibre Optic cable build requirement changed to 'Rodent Proof/armoured' Fibre
4.1.3	Supply of cabinets/racks changed to be supplied by Woolworths.
4.2	Added scope for Additions to Existing Installations
5.1	Industry standards list updated.
5.2	Updated Bill of Materials, CAT6A F/UTP, Fibre components. Note 'Commscope' comprises Netconnect and Systimax products.
5.3	Updated Approved Installers list
5.5	BD to IDF/NBN (Telco) Tie changed, now 4x CAT6 cables.
5.6 - 5.12	Updated rack layouts.
5.13	Added earthing diagram
6	Approvals & Review

Table Of Contents

1.0 Introduction	4
2.0 Scope	4
2.1 Purpose	4
2.2 Inclusions	4
2.3 Exclusions	5
2.4 Dependencies	5
2.5 Glossary of Terms	5
3.0 References	6
4.0 Standards Classification	7
4.1 New Installations	7
4.1.1 Installation (IT.X)	7
4.1.2 IT Electrical (IE.X)	8
4.1.3 Structured Cabling System (SC.X)	8
4.1.4 Installation Standards (IS.X)	10
4.1.5 Labelling (LB.X)	17
4.1.6 Duct & Cable Trays (DC.X)	19
4.1.7 Communication Pits and Pathways (CP.X)	19
4.1.8 Testing (TT.X)	20
4.1.9 Administration Documentation (AD.X)	22
4.1.10 Warranty (WT.X)	23
4.2 Scope for Additions to Existing Installations	24
5.0 Appendix	25
5.1 Industry Standards	25
5.2 Bill Of Materials	26
5.3 Approved Installers	26
5.4 Inspection Body	27
5.5 BD to IDF (Telco) Tie	28
5.6 Supermarket BD - 45 RU Layout	30
5.7 Metro BD - 45 RU Layout	31
5.8 Metro & BWS BD - 22 RU + 12 RU Layout	32
5.9 Dan Murphys BD - 45 RU Layout	33
5.10 Big W BD - 45 RU Layout	34
5.11 BWS BD - 12 RU Layout	35
5.12 Big W FD - 12 RU Layout	35
5.13 All Banners option FD - 24 RU Layout	35
5.14 All Banners - Rack Earthing	37
5.15 RF AP Layout - Part A	38
5.16 RF AP Layout - Part B	39
6.0 Document Control	40
6.1 Document Versions	40
6.2 Document Approval	40
6.3 Document Review & Input	40

1.0 Introduction

This document is issued as a specification for the supply and installation of the Structured Cabling System (SCS) incorporating Category 6_A and fibre optic cabling to support network equipment and associated IT Infrastructure for Woolworths Group.

This document describes the system requirements to be met by the SCS contractor (referred as 'the Contractor' throughout) to secure, under contract, the materials, design validation, engineering, installation, supervision, and training services for the infrastructure and SCS.

The entire SCS shall be designed, certified and warranted to either Commscope (Netconnect), Siemon or R&M specifications. The aim of this installation is to obtain the maximum performance from the installed cabling.

2.0 Scope

2.1 Purpose

The objective of this Cabling Standard is to provide the framework needed for a standardised cabling design across Woolworths Retail Stores.

This document is prepared for the Store Format team, initial designers & builders who will be installing cables, as well as for Facilities management, who are concerned with the Stores' ongoing property maintenance requirements as required by Law, Lessor and/or best industry practice.

2.2 Inclusions

- All Woolworths owned / leased and managed Stores including
 - Woolworths Supermarkets
 - Dan Murphy's
 - Metro
 - Big W
 - BWS
 - CFC's
- Stores Infrastructure clauses including
 - IT Electrical
 - Structured Cabling Systems (SCS)
 - Cable Labelling
 - Ducts and Cable Trays
 - Communication Pits and Pathways
- Installation Standards clauses
- Testing clauses
- Admin Documentation clauses
- Warranty clauses

2.3 Exclusions

- Distribution Centres, Corporate Offices & Data Centres.

2.4 Dependencies

Ref #	Dependencies	Comment
D.1	Standard Blueprint data/SCS drawings submitted with standard	These drawings have the specific quantity and location of data points on a generic store plan
D.2	Woolworths SDC's to supply current rack layouts to be used, refer to Appendix 5 sections for rack layouts if not provided.	Details where equipment positions are, required for data cabling to mount hardware.

2.5 Glossary of Terms

Term	Description
ACMA	Australian Communications and Media Authority
AFFL	Above finished floor level
ANSI	American National Standards Institute
AP	Access Point
AS	Australian Standards
AS/NZS	Australian / New Zealand Standards
ATS	Automated Transfer Switch
BMS	Building Management System
BD	Building Distributor
CCTV	Closed Circuit Television
CES	Communications Earthing System
CET	Communications Earthing Terminal
CP	Consolidation Point
DC	Distribution Centre
DECT	Digitally Enhanced Cordless Telephone
DGPO	Double General Purpose Outlet
EIA	Electronics Industries Association
EMI	Electromagnetic Interference
EMS	Environmental Management System
EPO	Emergency Power Off Switch
FD	Floor Distributor
FIP	Fire Indicator Panel
HI	Horizontal Interconnect
HCP	Horizontal Connection Point
HVAC	Heating, Ventilation and Air Conditioning
II	Intermediate Interconnect
IEC	International Electrotechnical Commission
ISO	International Organisation of Standardisation
MATV	Multi Access Television
MDF	Main Distribution Frame

MI	Main Interconnect
MUTOA	Multi-User Telecommunications Outlet Assembly
PE	Protective Earth
PoE	Power over Ethernet
PABX	Public Automated Branch Exchange
PTZ	Pan Tilt and Zoom Camera
RF	Radio Frequency
SAT	Site Acceptance Testing
SDC	Woolworths IT Store Delivery Coordinator
TC	Temperature Controlled Location
TO	Telecommunications Outlet
UPS	Uninterruptible Power Supply
F/UTP	Foiled / Unshielded Twisted Pair

3.0 References

The following referenced documents have been used as the foundation for creating this specification -

- [ISA: Stores Cabling Standard v1.0](#)

4.0 Standards Classification

4.1 New Installations

4.1.1 Installation (IT.X)

STD ID	Sub Category	Standard Clause
IT.1	SCS Qualifications & Training	The installer of the SCS shall be fully conversant and capable in the cabling of low voltage applications such as, but not limited to data, voice, security and other communications network systems.
IT.2	SCS Qualifications & Training	The SCS shall be installed and certified by the Woolworths Nominated SCS Contractor and shall not be subcontracted to others.
IT.3	SCS Qualifications & Training	The contractor shall be selected from the Woolworths Nominated SCS Contractor as nominated in 'Woolworths Nominated SCS Contractor' (see 'References' above) document.
IT.4	Approved Inspection Bodies	The Communications Subcontractor shall abide by all the relevant standards and regulations that apply to the installation of the SCS to be installed. Current released editions of the following Standards shall apply. Refer Appendix 5.1 for a copy of the industry reference standards
IT.5	Approved Inspection Bodies	The Communications Subcontractor shall submit all copper and fibre test results and all relevant tester calibration certificates to a NATA accredited inspection body listed in section 5.4 Inspection Body . The Scope of Accreditation shall be submitted to the Communications Subcontractor to include in the As-Built Documentation.
IT.6	Approved Inspection Bodies	All Fibre test results submitted to VTI shall be accompanied by the completed relevant forms available on the VTI website in the Downloads section titled "Fibre Reporting Sheet - Multimode".
IT.7	Approved Inspection Bodies	The NATA accredited inspection body shall be a NATA Type A inspection body and shall be independent from any Woolworths approved Communication Contractor or equipment supplier. The Inspection Body will charge a fee for this service. The fee shall form part of the Communications Tender.
IT.8	Approved Inspection Bodies	VTI shall be responsible to submit the Test Result Inspection Report to Woolworths. Contractors not complying will be removed from the Woolworths Nominated Contractors list.
IT.9	Approved Inspection Bodies	The independent inspection body shall be selected from the list of approved inspection bodies, which can be found in Appendix 5.2.

4.1.2 IT Electrical (IE.X)

STD ID	Sub Category	Standard Clause
IE.1	Grounding / Earthing	A 6 mm ² Protective Earth to each cabinet, connected to cabinet earth lug, wired directly to the nearest switchboard, in Computer Rooms, a Communications Earth Terminal (CET) shall be installed adjacent to the electrical distribution board (EDB).
IE.2	Grounding / Earthing	A 12 way (minimum) Earth Bar with screw terminals shall be installed within the cabinet, mounted to the vertical tray, to allow for patch panel earthing. A 6 mm ² Protective Earth shall be installed from the Earth Bar to cabinet lug.
IE.3	Grounding / Earthing	An individual 2.5 mm ² Protective Earth per CAT6 _A patch panel shall be installed, connected to the Earth Bar.

4.1.3 Structured Cabling System (SC.X)

STD ID	Sub Category	Standard Clause
SC.1	Cabling system	The CAT6 _A Shielded Structured Cabling System shall be installed in accordance with the SCS Vendor's recommendations and guidelines including all relevant Standards as listed.
SC.2	Cabling system	The Communications Subcontractor shall issue Warranty Documentation to the relevant vendor at the commencement of tender works.
SC.3	Cabling system	The Structured Cabling System shall be an 8 way Modular interconnect solution, with all the Telecommunications Outlets installed as home runs. All Telecommunications Outlets shall be terminated to T568A configuration.
SC.4	Cabling system	Horizontal and Backbone Cabling run between the Building Distributor and Floor Distributors, including above check out areas shall be installed within cable baskets or trays depending on ceiling type as detailed in Section 4.1.4.
SC.5	Cabling system	All Cabling shall be loose laid and secured at a minimum of 1000mm with Velcro© Ties or equivalent as specified in the Tender Drawings.
SC.6	Cabling System	Cabling shall be installed as per the installation methods described by the manufacturer and the methods pertaining to applicable standards.
SC.7	Cabling System - Optical Fibre Backbone	The Optical Fibre to be installed shall be 50/125µm Multimode OM4 Rodent Armoured Fibre for internal or external use as applicable.

SC.8	Optical Fibre Trays & Terminations	Optical Fibre Trays shall be installed for termination of fibre cables. Terminated using LC adapters.
SC.09	Backbone Architecture (Optical)	The Backbone Architecture for Optical Fibre shall be Distributed Architecture.
SC.11	Backbone Architecture (Optical)	All backbones emanating from the Building Distributor shall be interconnected to active equipment at Floor Distributors.
SC.12	Backbone Architecture (Optical)	All optical fibre cables shall be labelled at both ends as per the "Labelling" section of this document.
SC.13	Telecommunications (TO) Outlets	Category 6 _A F/UTP Telecommunication Outlet (TO) locations and mounting heights indicated on the Tender Drawings.
SC.14	TO - Work Area	TO's shall be installed in punch-outs within the Workstations or on faceplates in partition walls as indicated in the "Bill of Materials" of this document.
SC.15	TO - Work Area	All TO's installed into Temperature Controlled areas or areas which may be affected by hose-down with water, shall be installed using IP66 rated enclosures.
SC.16	TO - Work Area	All TO's shall be labelled as per the "Labelling" section of this document.
SC.17	TO - Faceplates	Where suitable punch-outs are provided on workstation furniture, they should be utilised together with furniture adapter or bezel. Where detail shown on plan, 2 port surface mount boxes shall be used. Preference for surface mount boxes where possible, to reduce cable damage.
SC.18	RF	1 x Category 6 _A Shielded outlet/cable shall be installed per AP specified on the survey document on the ceiling/purlin.
SC.19	RF	Cisco AP's, install locations as per survey document issued. NTT AP Installation mounting methods and labelling shall be followed.
SC.20	RF	1 x CAT6 _A Shielded 7.5m patch lead shall be supplied by Woolworths, and installed from outlet to AP. Slack to be coiled and positioned on the AP board.
SC.21	Building & Floor Distributors	Locations to be determined by the Woolworths Format Development Team and approved by Woolworths SDC, Cabinets supplied by Woolworths SDC.
SC.22	Floor Distributor	Additional FD locations shall be provided in order to comply with cable length standards. Refer to site plans for locations. Final locations to be agreed on by Woolworths SDC.
SC.23	Horizontal	Horizontal Category 6 _A Telecommunications Outlets shall be

	Cabling	terminated on 1RU 24 Port Shielded Patch Panels.
SC.24	Horizontal Cabling	It shall be installed as per the installation methods described by the manufacturer and the methods pertaining to applicable standards.
SC.25	Optical Fibre Links	The acceptable permanent link loss shall comply with AS/NZS 14763.3.
SC.26	Cabinet Layouts	Layouts for cabling and equipment positions to be provided by Woolworths SDC.

4.1.4 Installation Standards (IS.X)

STD ID	Sub Category	Standard Clause
IS.1	SCS Installation	The contractor shall coordinate with all trades for all services and pathways.
IS.2	SCS Installation	The contractor shall be deemed responsible for the collection and removal of their own waste produced from site in a safe and environmentally friendly manner.
IS.3	SCS Installation - Securing of Cabling	The securing of cables in all zones shall be via the means of Velcro® ties or equivalent at a minimum of 1000mm intervals. These ties shall be utilised where the path of the cables requires restraint for the purposes of manageability i.e.: within the BD, BD's and FD's to manage cable routing out of cable baskets via waterfalls and for grouping of cables where required.
IS.4	SCS Installation - Securing of Cabling	Securing cables within risers on vertical trays shall also utilise Velcro® ties or equivalent at a minimum of 1000mm intervals. Nylon cable ties may ONLY be utilized where signed off by Woolworths SDC.
IS.5	SCS Installation - Work Area Termination	The Builder shall coordinate all Work Area terminations with the Electrical Trade and Workstation Contractors.
IS.6	SCS Installation - Pulling Tension	The pulling tension of cables shall not exceed the cable manufacturer recommendations.
IS.7	SCS Installation - Bend Radius	The use of bend radius control devices shall be employed wherever a cable exits a tray where applicable. Where cable in tray is required to flow all proper cable transitions, waterfall and pre formed corners, shall be used throughout all pathways. i.e. a cable exiting a cable tray in a downward plane shall require strain relief and bend radius control.
IS.8	SCS Installation -	During installation, the bend radius of 4 pair cable shall not be less than eight times the outside diameter of the cable and ten times for

	Bend Radius	multi-pair cable unless this violates the cable manufacturers more stringent specifications.
IS.9	SCS Installation - Bend Radius	Once installed, the bend radius of F/UTP cabling shall not be less than four times the outer diameter of the cable for 4 pair cable and ten times for multi-pair cable unless this violates the cable manufacturers more stringent specifications.
IS.10	SCS Installation - Slack	There shall be no slack left on any horizontal cabling with the exception of 1m on all Optical Fibre Cables within enclosures.
IS.11	SCS Installation - Cable Wraps	Horizontal cabling laid loose in cable baskets/trays shall only be secured where the cables either enter or exit the cable tray or change direction. The securing of these cables shall be via Velcro® ties or equivalent
IS.12	SCS Installation - Cable Wraps	Backbone cabling within risers shall also be secured every 1000mm with Velcro® ties or equivalent means so as not to deform the cable sheath. Nylon cable ties may ONLY be utilized where signed off by Woolworths SDC.
IS.13	SCS Installation - Fire protection	All fire rated mediums shall comply with AS 4072.1 - Components for the protection of openings in fire-resistant separating elements – Service penetrations and control joints, and also as specified by FM Global. Any modifications to fire stopping shall be reinstated by the installer.
IS.14	SCS Installation Workmanship	All work shall be done in a workmanlike fashion to the highest standards in the telecommunications industry. All equipment and materials are to be installed in a neat and secure manner, while cables are to be properly dressed where applicable.
IS.15	SCS Installation -Workmanship	Workers shall clean any debris and waste at the close of each workday. Cabinet and racking shall remain tidy as work proceeds and shall be undertaken by the technician engaged in the installation process.
IS.16	SCS Installation - Shielding	All cabling installed that does not meet the minimum separation, in accordance with the specific SCS Vendor recommendations, from EMI sources eg: Power cabling, shall be suitably shielded with all cases to be sighted and approved by the Woolworths Technical Contact.
IS.17	Cable Pathways	Cable basket/tray/duct transitions shall be formed as per the manufacturer's specification.
IS.18	Cable Pathways	Any cable baskets installed shall be Hot Dipped Galvanised (not Zinc Electroplated) to reduce the likelihood of zinc whiskers. Cable baskets only to be used where false ceilings are installed.
IS.19	Cable Pathways	All metallic pathways shall be connected to the earthing system as per the Grounding / Earthing section of this document.
IS.20	Cable	Cables exiting the cable tray system and traversing further than 1

	Pathways	<p>metre shall be supported via catenary wire or equivalent with no cable ties to be employed, only Velcro® or equivalent. Cables shall not be tied to ceiling hangers or pipe work. All bends, tees and risers shall be formed as per product installation requirements.</p> <p>No catenary wires are to be run within trading areas, in view of customers, conduit should be used if required.</p>
IS.21	Cable Pathways	All cables exiting the cable basket/tray shall do so via the end or sides of the basket/tray utilising bend radius control devices and protection (flexi or rigid conduit) where required if sharp edges exist.
IS.22	Cable Pathways	All vertical cable baskets/trays at finished floor level shall be protected by a metallic cover from finished floor level to 1500mm AFFL to minimise cable damage.
IS.23	Cable Pathways	Cabling and/or related hardware shall not be secured to a cable, conduit or pipe of another service (e.g. a power cable/conduit or water/waste pipe).
IS.24	Cable Pathways	<p>Custom cabling and/or equipment installed in a suspended ('false') ceiling shall not be—</p> <p>(a) laid on the ceiling tiles or their supports; or</p> <p>(b) tied to the ceiling hanger rods.</p> <p>Note: Cables should be secured to independent supports such as a tray, trough, catenary support system within the ceiling space or should be secured directly to the underside of the floor above.</p>
IS.25	Cable Pathways - False Ceilings	All Horizontal and Backbone cabling to be installed within false ceilings shall be installed laid loose in a cable basket, tray, duct or catenary wire using the appropriate suspension system required for the environment it is installed. Sizes of cable trays/ducts to be installed are specified in the standard issued drawings.
IS.26	Cable Pathways - False Ceilings	All horizontal cabling shall be laid loose utilising Velcro® or equivalent ties at a minimum 1000mm intervals to retain cabling where required ie: change of directions, waterfalls etc.
IS.27	Cable Pathways - False Ceilings	<p>Cables exiting the cable tray system and traversing further than 1m shall be supported via catenary wire or equivalent with no cable ties to be employed, only Velcro® or equivalent.</p> <p>All sharp edges shall be removed</p>
IS.28	Cable Pathways - Work Area	All horizontal cabling entering the Work Area i.e. Workstations, Cavity walls, ducted skirting etc, shall be supported at intervals no greater than 1 metre with an approved method of support.
IS.29	Cable Pathways - Work Area	Accessible vertical drops shall be supported at intervals no greater than 1 metre with an approved method of support.
IS.30	Cable Pathways - Work Area	All ducts/conduits shall not exceed 60% fill. A maximum of 80% fill is allowed to accommodate unplanned additions after initial installation.

IS.31	Cable Pathways - Work Area	All cuts and penetrations shall be de-burred and appropriately bushed to avoid sharp edges.
IS.32	Cable Pathways - Work Area	No slack or service loops shall be left at the work area except 1m for optical fibre cables.
IS.33	Cable Pathways - Work Area	Bend radius shall be maintained within all workstations and ducts as per the "Bend Radius" section of this document
IS.34	Cable Pathways - Cable Basket	All cable baskets shall be sized to allow 60% spare capacity. A maximum of 80% fill is allowed to accommodate unplanned additions after initial installation.
IS.35	Cable Pathways - Cable Basket	Any communications cabling cable basket shall be used only for the SCS communications cabling, all other trades shall supply their own pathways.
IS.36	Cable Pathways - Cable Basket	Where cable in baskets is required to flow formed corners, shall be used throughout all pathways.
IS.37	Cable Pathways - Cable Basket	All cable trays and cable baskets shall be connected to the earthing system.
IS.38	Cable Pathways - Cable Basket	Where cables leave tray appropriate cable protection shall be utilised.
IS.39	Cable Pathways - Cable Basket	The aim of this installation is to obtain the maximum performance from the installed cabling and therefore the site will be deemed a cable tie free site, utilising Velcro® ties or equivalent and cable baskets for cable reticulation.
IS.40	Cable Pathways - Internal Conduits	All internal conduits shall be sized to allow 60% spare capacity. A maximum of 80% fill is allowed to accommodate unplanned additions after initial installation with the provision of a minimum 2 'future' cable drawstrings / wires.
IS.41	Cable Pathways - Internal Conduits	Securing internal conduits shall be at 1.5m centres with expansion joints every 12m and where conduit crosses any structural expansion joint.
IS.42	Cable Pathways - Internal Conduits	All bends and sweeps shall be manufactured inspection type where applicable.
IS.43	Cable Pathways - Internal Conduits	Draw boxes shall be installed at intervals no greater than 12m and sized accordingly as not to exceed the minimum bend radius of the cable being installed.

IS.44	Cable Pathways - Internal Conduits	All conduits shall have a draw wire installed in the same pull as the cabling for later use.
IS.45	Cable Pathways - Internal Conduits	All joints shall be glued with an appropriate PVC joining agent.
IS.46	Cable Pathways - Internal Conduits	All conduits located in Temperature Controlled areas / cool rooms shall be sealed at each end with sealant to reduce the ingress of moisture.
IS.47	Cable Pathways - External Conduits	All external conduits shall be sized to allow 40% spare capacity.
IS.48	Cable Pathways - External Conduits	Securing external conduits shall be at 1.5m centres with expansion joints every 12m and where conduit crosses any structural expansion joint.
IS.49	Cable Pathways - External Conduits	All bends and sweeps shall be manufactured inspection type where applicable.
IS.50	Cable Pathways - External Conduits	Draw boxes shall be installed at intervals no greater than 12m and sized accordingly as not to exceed the minimum bend radius of the cable being installed.
IS.51	Cable Pathways - External Conduits	All conduits shall have a draw wire installed in the same pull as the cabling for later use.
IS.52	Cable Pathways - External Conduits	All joints shall be glued with an appropriate PVC joining agent.
IS.53	Cable Pathways - Underground Conduits	All underground communications conduits shall comply with AS/NZS 3084 , AS/CA S008 and AS/CA S009.
IS.54	Cable Pathways - Underground Conduits	The conduits shall be installed as per the standard issued drawings.

IS.55	Cable Pathways - Underground Conduits	No external run shall exceed 50m without a communications pit with each pit clearly labelled to identify what is beneath the pit cover.
IS.56	Cable Pathways - Underground Conduits	All changes in direction shall be made via a communications pit.
IS.57	Cable Pathways - Underground Conduits	Change of direction within pits shall use factory manufactured sweeps. No 90° bends shall be installed.
IS.58	Cable Pathways - Underground Conduits	All conduits shall have a draw wire installed in the same pull as the cabling for later use.
IS.59	Cable Pathways - Underground Conduits	All joints shall be glued with an appropriate PVC joining agent
IS.60	Cable Pathways - Conduits in concrete	Where UPVC conduit is embedded in concrete which is screened or vibrated after pouring, or where conduits may be subjected to heavy traffic prior to pour, the Builder shall in both cases, provide constant supervision to ensure that conduit runs are not damaged.
IS.61	Cable Pathways - Conduits in concrete	Where conduit is damaged during installation, the affected section shall be cut and a new piece installed.
IS.62	Cable Pathways - Conduits in concrete	The Builder shall be responsible for such damage and shall make good at his own cost. Curves in conduits shall not have a radius less than standard long sweep bends.
IS.63	Cable Pathways - Conduits in concrete	All conduits entering junction boxes etc. shall be tied 300mm away from the box, thus ensuring at least 300mm straight run of conduit into the box.
IS.64	Cable Pathways - Conduits in concrete	Sealing caps shall be placed on all conduits before pouring is commenced, thus ensuring that no water or slurry enters the conduit. Conduits shall be swabbed or blown clear before wiring is installed.
IS.65	Cable Pathways - Conduits in concrete	All conduits in slab shall be installed above the bottom layer of reinforcement and securely tied in place, boxes firmly fixed to form ply and be separated from other conduits in a slab by a distance equal to the diameter of the conduit. Conduits shall be turned out at the slab and be left protruding at least 200mm AFFL and later trimmed back to 25-30mm AFFL.

IS.66	Cable Pathways - Conduits in concrete	All conduits in concrete shall be sized to allow 60% spare capacity.
IS.67	Cable Pathways - Conduits in concrete	Every care shall be taken to eliminate the possibility of water entering the floor conduit system.
IS.68	Cable Pathways - External Pits and Conduits (Carrier Services)	External Communications Pits and Conduits are to be supplied and installed by the base building electrical contractor.
IS.69	Cable Pathways - External Pits and Conduits (Carrier Services)	All External Communications Pits and Conduits for Carrier Services shall comply with AS/NZS 3084, AS/CA S008 and AS/CA S009. These pathways shall be used to connect all buildings on site to the infrastructure within the BD.
IS.70	Cable Pathways - External Pits and Conduits (Carrier Services)	Two x 100mm Communications Conduits shall be installed with Communications Pits no more than 50m apart or wherever the conduit path changes direction. The 100mm conduits shall be P100 White Telecommunications conduits.
IS.71	Cable Pathways - External Pits and Conduits	All external cables shall be labelled as per the "Labelling" section of this document.
IS.72	Cable Pathways - Penetrations	All penetrations shall be verified as adequate in terms of size and location. All coordination of penetrations is the Builder's responsibility.
IS.73	Cable Pathways - Penetrations	All cable tray work shall be electrically continuous through penetrations.
IS.74	Cable Pathways - Penetrations	All penetrations through acoustic barriers shall be stopped with the appropriate materials to maintain the intended acoustic levels and fire rating.
IS.75	Cable Pathways - Penetrations	Sleeving shall be installed to all core holes. This sleeving shall have a minimum of 25mm protruding from either side of the core.
IS.76	Cable Pathways - Penetrations	Approval shall be obtained from the Builder prior to installation of all penetrations.

IS.77	Cable Pathways - Fire rating	All cabling entering and or exiting fire rated risers and penetrating slabs shall be fire rated at the completion of installation of services where applicable.
IS.78	Cable Pathways - Fire rating	The fire-rating medium shall comply with AS 4072.1.
IS.79	Cable Pathways - Fire rating	Components for the protection of openings in fire-resistant separating elements – Service penetrations and control joints and also as specified by FM Global. The Builder is responsible for all Fire Rating and Waterproofing.
IS.80	Specified Vendors	The contractor shall supply and install the SCS using one of the approved vendors included in the table in Appendix 5.4 Woolworths Specified Vendors.

4.1.5 Labelling (LB.X)

STD ID	Sub Category	Standard Clause
LB.1	Outlet Labelling	<p>The Contractor shall supply and install appropriately sized printed labels sized to suit the faceplate, and shall consist of engraved Traffolyte or Brady label material with black lettering on a white background.</p> <p>The numbering of telecommunications outlets served from the BD and FD's respectively shall be as follows:</p> <ul style="list-style-type: none"> • T/O labelling should follow the form BD1-nnn where; BD1 identifies that TO is fed from the BD1 cabinet and nnn is the sequential numeric 001 to 999. • T/O labelling should follow the form FD1-nnn where; FD1 identifies that TO is fed from the FD1 cabinet and nnn is sequential numeric 001 to 999. • T/O labelling should follow the form FD2-nnn where; FD2 identifies that TO is fed from the FD2 cabinet and nnn is sequential numeric 001 to 999. <p>Each Category 6_A F/UTP and multi-pair cable shall be labelled at both ends with a proprietary-manufactured, printed, wrap-around label with the cable number corresponding to that of the telecommunications outlet (as detailed above). These labels shall be fixed onto each end of the cable at no more than 100mm from the termination point.</p> <p>An additional outlet label is required where an outlet is installed above a ceiling or higher than 2 metres from the ground, such as RF AP's in a store room or in a high ceiling area.</p> <p>Label to be fixed to ceiling grid and shall consist of engraved Traffolyte material with white lettering on a black background (20mm H x 50mm W), label to be held in place by screws. This requirement shall apply to any location that meets the criteria detailed.</p>

LB.2	Patch Panel Labelling	<p>Patch panel ports shall be numbered continuously and consecutively commencing from the left-hand side to the right-hand side of the panel. Labelling shall continue along the whole patch panel even where the panel is not fully populated.</p> <p>The front of each RJ45 patch panel shall be clearly labelled with the individual telecommunications outlet numbers connected to each port.</p> <p>Note that the cabinet identifier is not required on each patch panel outlet, only the outlet number, as the label on the cabinet designates the cabinet identifier.</p> <p>Labels shall be sized to suit the jack panel, and shall consist of engraved Traffolyte material or Brady label (#PTL-39-422) material with black lettering on a white background.</p> <p>In addition an RFAP number designation label shall be added along with the outlet number, The labels shall read “AP-n”, where “n” denotes the sequential number.</p>
LB.3	Fibre Backbone	<p>Each group of 12 terminated fibre cores (6 x duplex ports) shall be identified by a label stating the capacity and destination termination of the cable.</p> <p>The label shall be suitably sized to extend across all three duplex ports.</p> <p>Each duplex termination shall be labelled to identify the two fibre cores contained therein.</p> <p>Example;</p> <p>Backbone between BD1 and FD1 : 12 Core to FD1</p> <p>Backbone between FD2 and BD1 : 12 Core to BD1</p> <p>Labels shall be sized to suit the jack panel, and shall consist of engraved Traffolyte material or Brady label (#PTL-39-422) material with black lettering on a white background</p> <p>Additionally, the cable shall be labelled at both ends with a manufactured, printed, wrap-around label with the cable number corresponding to that on the designation strip identifier (as detailed above). The labels shall be fixed onto each end of the cable at no more than 100mm from the termination point.</p>
LB.4	F/UTP SCS Tie Cable to NBN/ IDF	<p>For each tie cable termination, 4 x individual CAT6_A cables are to be clearly identified on the patch panel above the group of six ports.</p> <p>Patch Panel label shall incorporate the label “4x F/UTP tie to NBN”</p> <p>Outlets shall incorporate the naming of ‘NBN’ and the end of the outlet number, example : BD-1- NBN1, BD-2- NBN</p> <p>Labels shall be sized to suit the jack panel, and shall consist of engraved Traffolyte material or Brady label (#PTL-39-422) material with black lettering on a white background</p> <p>Additionally, each cable shall be labelled at both ends with a manufactured, printed, wrap-around label with the cable number corresponding to that on the designation strip identifier (as detailed above). These labels shall be fixed onto each end of the cable at no more than 100mm from the termination point.</p>

LB.5	RF AP Labelling	<p>All RF AP's shall display a label identifying the RF AP designation, and another for the T/O designation, either attached to the mounting board, or to the ceiling grid directly under the RF AP location.</p> <p>The labels shall read "RF AP-n", where "n" denotes the sequential number shown on the site plan and the T/O Label shall read 'BD or FD'n XX' , where n = the FD number and XX is the patch panel outlet number.</p> <p>These are to be fixed to the ceiling grid or on mounting board and shall consist of engraved Traffolyte material with white lettering on a blue background (30mm H x 80mm W), label to be held in place by screws.</p> <p>T/O's identifiers for RF AP's shall be sized to 30mm H x 80mm W.</p> <p>No labels should be placed directly on RF AP devices.</p>
LB.6	SCS Enclosures / Racks	<p>Each SCS enclosure shall have its designated cabinet name label positioned on the front of the door at the top of the cabinet. Labels shall be engraved Traffolyte material with 20mm high white lettering on a black background. (Eg. 'SCS BD', 'SCS FD1', 'SCS FD2' etc..)</p>

4.1.6 Duct & Cable Trays (DC.X)

STD ID	Sub Category	Standard Clause
DC.1	Duct & Cable Trays	<p>Inter-building and or Carrier Ducts shall be labelled as every 10 metres with a permanent label, designating the ducts use as Communications Cabling Only. This labelling shall be Traffolyte of a minimum size of 40mm x 100mm with White 30mm letters on a Blue background affixed to the duct in a prominent position top and bottom.</p>

4.1.7 Communication Pits and Pathways (CP.X)

STD ID	Sub Category	Standard Clause
CP.1	Communication Pits & Pathways	<p>The Electrical Trades shall label the Communications Pits with directional arrows for all conduits entering and exiting these pits</p>
CP.2	Communication Pits & Pathways	<p>All roadway crossings shall have directional arrows and descriptive labelling of services.</p>

4.1.8 Testing (TT.X)

STD ID	Sub Category	Standard Clause
TT.1	SCS	All cabling shall be 100% tested against installation conformance testing requirements as defined by AS/NZS 11801.1, utilising a minimum compliant level IV test equipment as defined in IEC 61935.1 or its replacement.
TT.2	SCS	All copper and fibre testing should be performed by staff accredited by an authorised training centre of the specific test equipment used in testing.
TT.3	SCS	Testing of Permanent Link shall be performed prior to system hand-over.
TT.4	SCS	All (100 percent) of the F/UTP and optical fibre horizontal cables and backbone cables shall be tested.
TT.5	SCS	All results shall be stored and presented as per the "Administration Documentation" section of this document.
TT.6	SCS - Copper Testing Procedures	All links shall be tested as per AS/NZS 11801.1 Class E _A Permanent Link (Latest revision). Plot Data shall be included with all results.
TT.7	SCS - Copper Testing Procedures	Each tester used shall have a valid calibration certificate (no more than 1 year old) issued by an accredited NATA or cable tester manufacturer agent. Calibration certificates shall be supplied in PDF format as per section Administration Documentation.
TT.8	SCS - Copper Testing Procedures	All test results submitted shall PASS, no marginal passes shall be accepted.
TT.9	SCS - Optical Fibre Testing Procedures	All cores of optical fibre cable shall be tested in both directions using both 850m and 1300m wavelengths with a power meter – light source.
TT.10	SCS - Optical Fibre Testing Procedures	Testing shall be carried out against compliance requirements of AS/NZS 11801.1 utilising methodologies specified in AS/NZS 14763.3
TT.11	SCS - Optical Fibre Testing Procedures	The 1-cord method shall be the preferred method of testing.
TT.12	SCS - optical Fibre Testing Procedures	The maximum attenuation of any optical fibre core shall not exceed the calculated maximum fibre link attenuation. An encircled flux launch conditioned cord output in conjunction with light source shall be used for all power meter light source testing.

TT.13	SCS - Optical Fibre Testing Procedures	Reference cords meeting the requirements of AS/NZS 14763.3 shall be used for all testing. A zero reference shall be established before testing commences using the recommended method referred to in the latest version of AS/NZS 14763.3.
TT.14	SCS - Optical Fibre Testing Procedures	The zero reference shall be established each time the light source and power meter is turned on, or the test leads are disconnected from the tester(s).
TT.15	SCS - Optical Fibre Testing Procedures	Test results shall be supplied on the VTI reporting sheet with a signed statement of compliance and authenticity. Form can be downloaded from VTI's website: http://www.vti.net.au/downloads
TT.16	SCS - Optical Fibre Testing Procedures	The power meter and light source shall as a minimum include: Fibre manufacturer and associated part number <ul style="list-style-type: none"> ● Performance level of fibre optic cable ● Referencing/Zeroing method ● Length ● Propagation delay ● Light Budget ● Number of mated connectors under test ● Number of splices under test
TT.17	SCS - Auxiliary Electrical	It is expected that industry standard testing will be completed. In addition, functional testing of the UPS, Generator and dual electrical circuits will be completed in the presence of the Woolworths' Technical Contact or their representative. This will include the turning off of mains power supplies to ensure the effective operation of each auxiliary power supplies type.

4.1.9 Administration Documentation (AD.X)

STD ID	Sub Category	Standard Clause
AD.1	Documentation Folders	The contractor shall provide the Woolworths IT Technical Contact with soft copies format. Contact : sdc@woolworths.com.au
AD.2	Documentation Folders	All documentation shall be split into building sets with a numbering scheme to include each document as part of the final documentation set.
AD.3	SCS - CAD Drawings As Builts	A complete set of CAD drawings shall be produced, both hard (B1 in size) and soft copies in DWG format. Communications As-Built drawings shall include all TO locations, communications cabinets, cable pathways and specific application/device locations with outlet locations marked and numbered accordingly.
AD.4	SCS - Test Results	Test Results for all copper and fibre cabling shall be provided, a summary of test results within each and complete test results in native tester file format and appropriate viewing software included in the As-Built Documentation (to be either printed, shared in a shared drive or sent via email).
AD.5	SCS - Calibration Certificates	Calibration Certificates for all Testers used to test both Copper and Fibre cabling shall be provided.
AD.6	SCS - Warranty Forms	A copy of a warranty application certificate, and 'upon receipt' original warranty certificate shall be provided.
AD.7	SCS - TCA1 & TCA2 Forms	TCA1 forms relevant to all works completed shall be provided Note: TCA2 forms only required if existing defects are found by the installer.
AD.8	SCS - Product information	A "Bill of Materials" including Part Numbers and Distributor details of all products installed (complete product information) shall be provided
AD.9	SCS - Samples	The contractor shall supply samples and any relevant catalogues of any substituted components to be installed for approval by the Woolworths IT Technical Contact.

4.1.10 Warranty (WT.X)

Describes the clauses applicable to different types of warranty applicable to cabling infrastructure

STD ID	Sub Category	Standard Clause
WT.1	System Warranty	<p>A minimum of twenty (20) year Systems Warranty for an Integrated Cabling System shall be provided for an end-to-end Channel Warranty which covers applications and components on all passive telecommunications equipment and cable for the duration of the warranty. The cable and connecting hardware product shall meet the requirements of the standard-base model of a 4 connector, 100 metre channel model.</p> <p>Labour costs associated with the replacement of any non-performing product shall also be covered by the warranty.</p>
WT.2	Product Warranty	<p>The manufacture of passive telecommunications equipment used in a manner not associated with the System Warranty shall have a minimum of five (5) year Component Warranty on all its products. The Products Warranty covers the components against defects in material or workmanship under normal and proper use.</p>
WT.3	Application Warranty	<p>Applications Supported include those approved by the Institute of Electronic and Electrical Engineers (IEEE). ISO/IEC/IEEE 8802-3, specifies Ethernet local area network operation for selected speeds of operation from 1 Mb/s to 10 Gb/s</p>

4.2 Scope for Additions to Existing Installations

This section specifies differences and allowances where modifications are being made to existing installations.

The entire SCS shall be designed, certified and warranted to either Commscope (Netconnect), Siemon or R&M specifications. The aim of this installation is to obtain the maximum performance from the installed cabling.

STD ID	Sub Category	Standard Clause / Scope	New Scope / Difference applicable to existing installations
SC.1	Cabling system	<i>The CAT6A Shielded Structured Cabling System shall be installed in accordance with the SCS Vendor's recommendations and guidelines including all relevant Standards as listed.</i>	CAT5e & CAT6 can be retained, where cable is being reterminated. Where new cabling runs are required, CAT6 U/UTP shall be installed and terminated on CAT6 U/UTP panels.
SC.23	Horizontal Cabling	<i>Horizontal Category 6_A Telecommunications Outlets shall be terminated on 1RU 24 Port Shielded Patch Panels.</i>	CAT6 U/UTP cabling shall be terminated on CAT6 U/UTP panels.
NA	Cabling system	<i>Copper backbone</i>	No scope to reinstate or rerun copper backbone between cabinets
IS.30	Cable Pathways - Work Area	<i>All ducts/conduits shall not exceed 60% fill. A maximum of 80% fill is allowed to accommodate unplanned additions after initial installation.</i>	All ducts/conduits shall not exceed 100% fill. Install additional pathways where fill is exceeded.
IS.34	Cable Pathways - Cable Basket	<i>All cable baskets shall be sized to allow 60% spare capacity. A maximum of 80% fill is allowed to accommodate unplanned additions after initial installation.</i>	All baskets shall not exceed 100% fill Install additional pathways where fill is exceeded..
TT.6	SCS - Copper Testing Procedures	<i>All links shall be tested as per AS/NZS 11801.1 Class E_A Permanent Link (Latest revision). Plot Data shall be included with all results.</i>	All links shall be tested as per AS/NZS 11801.1 Class E Permanent Link (Latest revision). Plot Data shall be included with all results.
AD.3	SCS - CAD Drawings As Builts	<i>A complete set of CAD drawings shall be produced, soft copies in DWG format...</i>	Only new additions or changes to be shown on plans.

5.0 Appendix

5.1 Industry Standards

Standard	Description
AS/NZS 2676.1	Guide to the installation, maintenance, testing and replacement of secondary batteries in buildings - Vented cells
AS/NZS 2676.2	Guide to the installation, maintenance, testing and replacement of secondary batteries in buildings - Sealed cells
AS/NZS 2967	Optical fibre communication cabling systems safety
AS/NZS 3000	Australian/New Zealand Wiring Rules
AS/NZS 3008	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical Australian installation conditions
AS/NZS 3011.1	Electrical installations - Secondary batteries installed in buildings - Vented cells
AS/NZS 3011.2	Electrical installations - Secondary batteries installed in buildings - Sealed cells
AS/NZS 11801.1	Telecommunications installations-Integrated Telecommunications Cabling Systems for Commercial Premises
AS 11801.2	Generic cabling for customer premises Office premises
AS 11801.3	Information technology – Generic cabling for customer premises Industrial premises
AS 11801.6	Information technology – Generic cabling for customer premises Distributed building services
AS/NZS 3084	Telecommunications installations-Telecommunications Pathways and Spaces for commercial buildings
AS/NZS 3085.1	Telecommunications installations- Administration of communications cabling systems Part 1: Basic requirements
AS/NZS 3760	In-service safety inspection and testing of electrical equipment
AS/NZS 4072.1	Components for the protection of openings in fire-resistant separating elements - Service penetrations and control joints
AS/NZS 14763.2	Information technology - Implementation and operation of customer premises cabling. Part 2: Planning and installation
AS/NZS 14763.3	Implementation and operation of customer premises cabling Part 3: Testing of optical fibre cabling
AS 4696	Australian Standard for the Hygienic Production and Transportation of Meat and Meat Products for Human Consumption
IEC 61935-1	Testing of balanced communication cabling in accordance with ISO/IEC 11801 - Installed cabling
AS/CA S008	Requirements for authorised cabling products
AS/CA S009	Installation requirements for customer cabling (wiring rules)
NZS 4104*	Seismic restraint of building contents
NZS 4219*	Specification for Seismic Resistance of Building Engineering Systems
International	
TIA/EIA 606A	Administration standard for Telecommunications Infrastructure of Commercial Buildings
ANSI/TIA/EIA-862	Building Automation Systems Cabling Standard for Commercial Buildings.
FM Global	
Datasheet 5-32	Electronic Data Processing Systems
Datasheet 5-48	Automatic Fire Detectors
Datasheet 2-8N	Installation of Sprinkler Systems
Commscope	
Commscope Training Manual	Where conflicts between standards occur, the more stringent requirements apply.

	For EMI purposes, segregation between power sources and/or power cabling and communications cabling shall comply with the Commscope Training Manual requirements.
Siemon	
Siemon Training Manual	Where conflicts between standards occur, the more stringent requirements apply. For EMI purposes, segregation between power sources and/or power cabling and communications cabling shall comply with the Siemon Training Manual requirements.
R&M	
R&M Training Manual	Where conflicts between standards occur, the more stringent requirements apply. For EMI purposes, segregation between power sources and/or power cabling and communications cabling shall comply with the Siemon Training Manual requirements.

* Required only for New Zealand

5.2 Bill Of Materials

SCS COMPONENT	Commscope	Siemon	R&M
CAT6 _A F/UTP cable (Grey)	CS44Z1 WHT C6A 4/23 F/UTP RL 305M	9A6L4-A5-02 CAT6 _A F/UTP LSOH	R308247
CAT6 _A RJ45 Patch panel	CPP-SDDM-SL-1U-24	TM-PNLZ-24	R813483
CAT6 _A RJ45 outlets	AMP-TWIST SLX, 6AS, BLK	Z-MAX: Z6A-S02; Z6A-45-S02	R813505
Surface Mount Box 2 Port	1-1116698-3	MX-SMZ2-02	R795822
Internal Fibre 12 core OM4 (Armoured)	Z-012-LN-5K-F12BK/20G/HT S/D	9GG5H012G-T501	R512394
19" 1RU Fibre Shelf	600G2-1U-UP-FX	FCP3-RACK	R795926
LC Connector Plate	G2-1U-24LC-DPLX-EMT		
LC Connector/Adapter	MFA-LC02-AQ/LP-SHUTTERED	RIC-F-LCQ12-01C	R823204
Fibre Splice Tray	RS-2AF-16SF	TRAY-3	R308444

5.3 Approved Installers

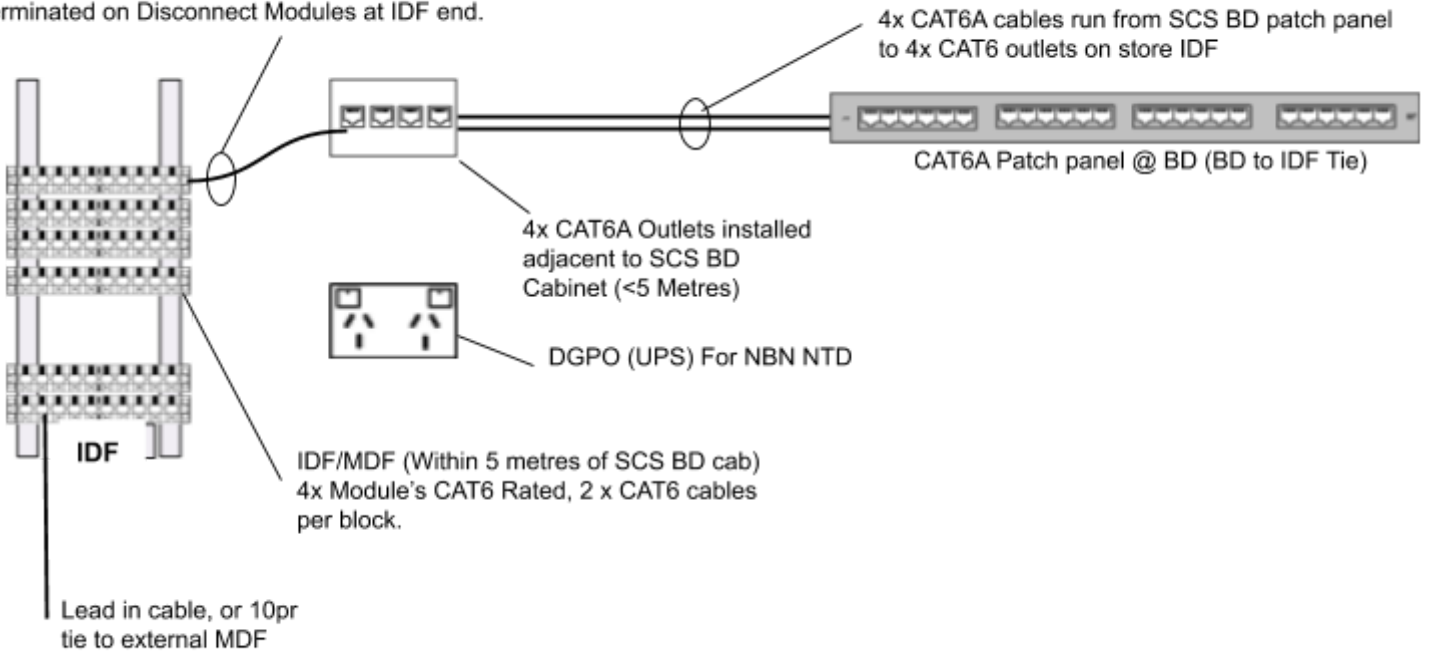
Company	URL	State
Alliance SI	www.alliancesi.com.au	All states
Apex Electrical	www.apexelectrical.com.au	VIC
ARA Group	www.aragroup.com.au	NSW, QLD
Ardayne Engineering	www.ardayne.com.au	All states
BJM Data Cabling Systems	www.bjmsa.com.au	SA
BSH Electrical	www.bsh-electrical.com.au	SA, TAS
Cablelink Communications	www.cablelinkcoms.com.au	SA
Communications Services	www.csq.com.au	QLD
Contact Electrical	www.contactgroup.com.au	TAS
Coppercore	www.coppercore.com.au	NSW
Datalec Services	www.datalecservices.com.au	NSW
Datatel Communications	www.datatel.com.au	All states
DEC Installations	www.decinstallations.net	NT
Downer Group	www.downergroup.com	All states
ENGIE Services (Formerly DESA)	www.desa.com.au	All states
Everett-Smith	www.everettsmith.com.au	WA
Fast Track Communications	www.fasttrackcomms.com.au	NSW
Fredon Industries	www.fredon.com.au	All states
Global Cabling	www.globalcs.com.au	WA
JCB Communications	www.jcbcomms.com.au	NSW
KW Electric	www.kwelectric.com.au	QLD
Lanec Services	www.lanec.com.au	VIC
M+G	www.mplusq.com.au	VIC, SA
Nilsen	www.nilsen.com.au	All states
OAS Communications	www.oas.com.au	NSW
Programmed	www.programmed.com.au	All states
Recom Electrical	www.recomelectrical.com.au	All states
Russell Smith	www.russellsmith.com.au	SA
Servcore	www.servcore.com.au	All states
S.J. Electric	www.trivantage.com.au	All states
Star Group	www.star-group.com.au	NSW, QLD
Stowe Australia	www.stoweaustralia.com.au	NSW, VIC, QLD, TAS
Tad-mar Electrical	www.tadmar.com.au	SA
Wired Communication Solutions	www.wiredsolutions.com.au	NSW, VIC


5.4 Inspection Body

Woolworths Approved Inspection Bodies	
Company	VTI Services
Contact(s)	Murray Teale
Phone	+61 2 4658 0914
Email	office@vti.net.au
Web	http://www.vti.net.au/home
Address	19 Adams Circuit Elderslie NSW 2570 Australia
NATA Accreditation Number	15120

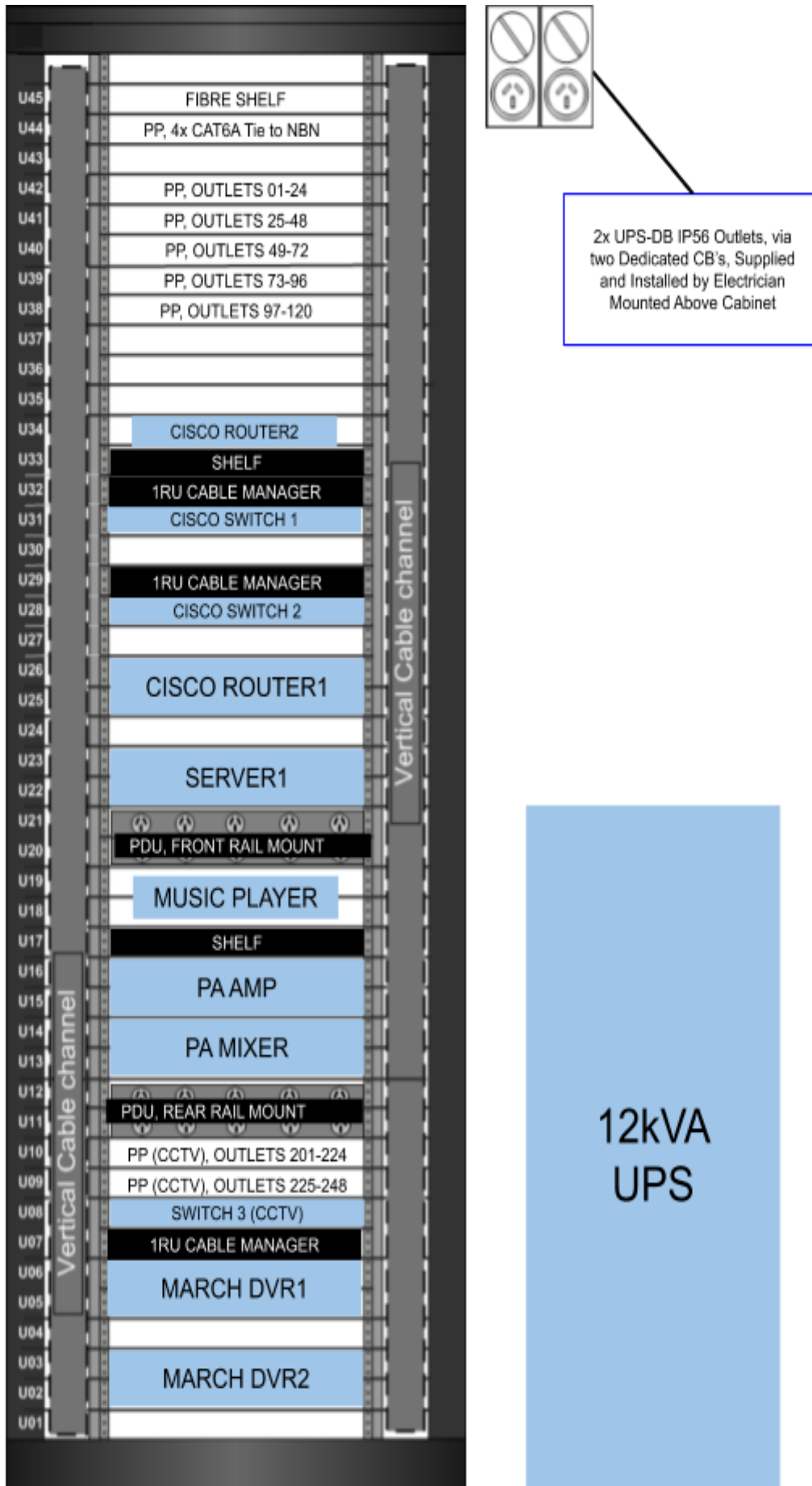
5.5 BD to IDF (Telco) Tie

RJ45 patch leads, RJ45 plug end connected to outlet, terminated on Disconnect Modules at IDF end.

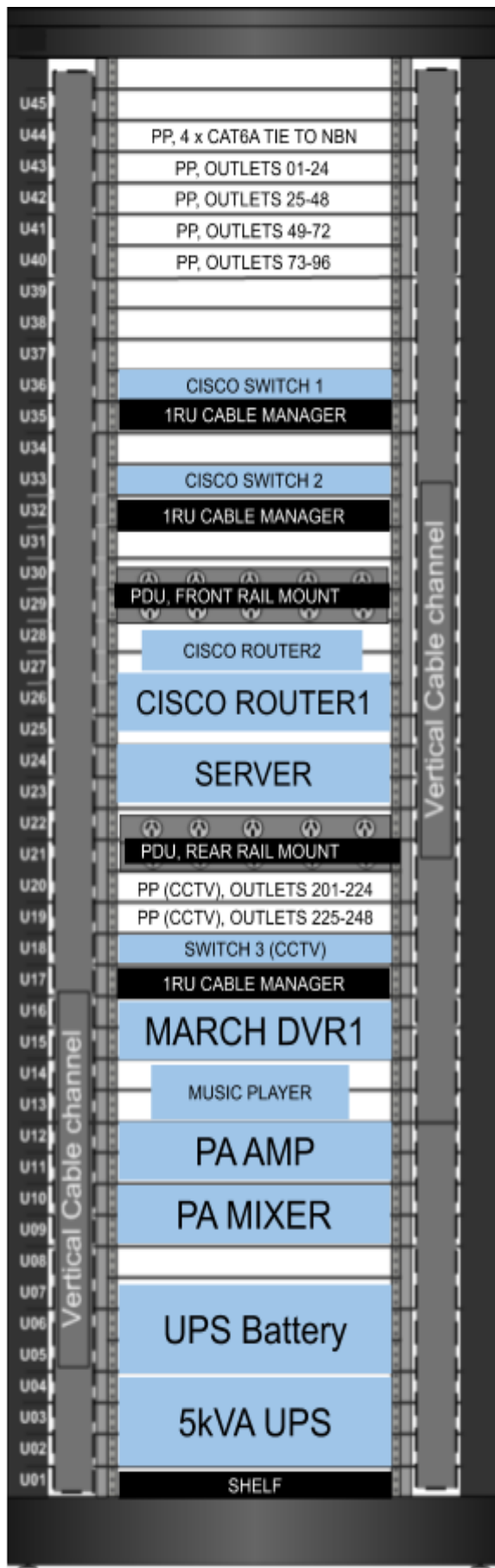


DRAWING TITLE SCS BD to Telco Tie / NBN	SCS SPECIFICATION Stores	SCS DRAWING# SCS D1
DATE OF ISSUE 2020 Q3	AUTHOR Woolworths, SIE	WOOLWORTHS GROUP 

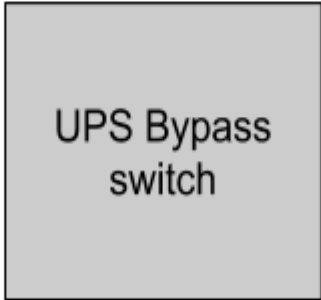
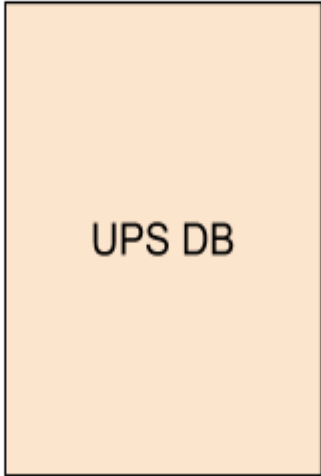
5.6 Supermarket BD - 45 RU Layout



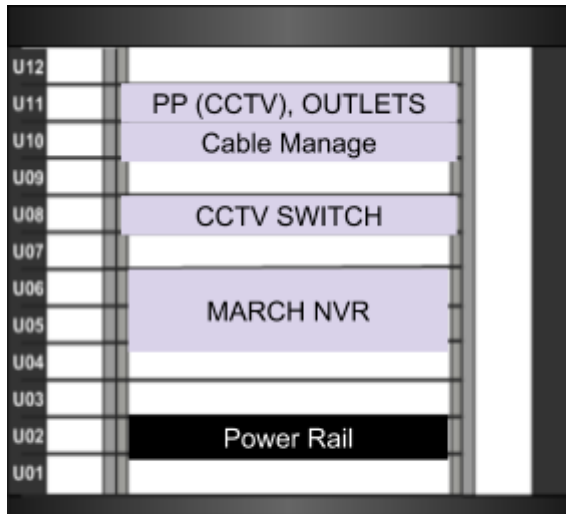
5.7 Metro BD - 45 RU Layout



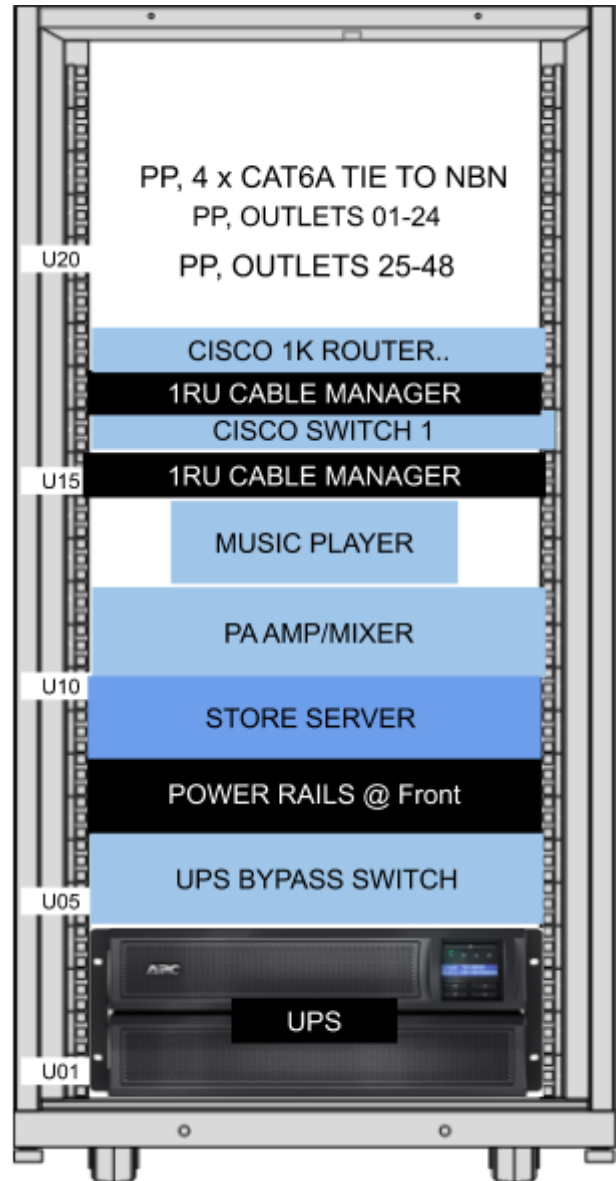
2x UPS-DB IP56 Outlets, via two Dedicated CB's, Supplied and Installed by Electrician Mounted Above Cabinet



5.8 Metro & BWS BD - 22 RU + 12 RU Layout

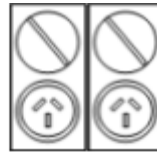
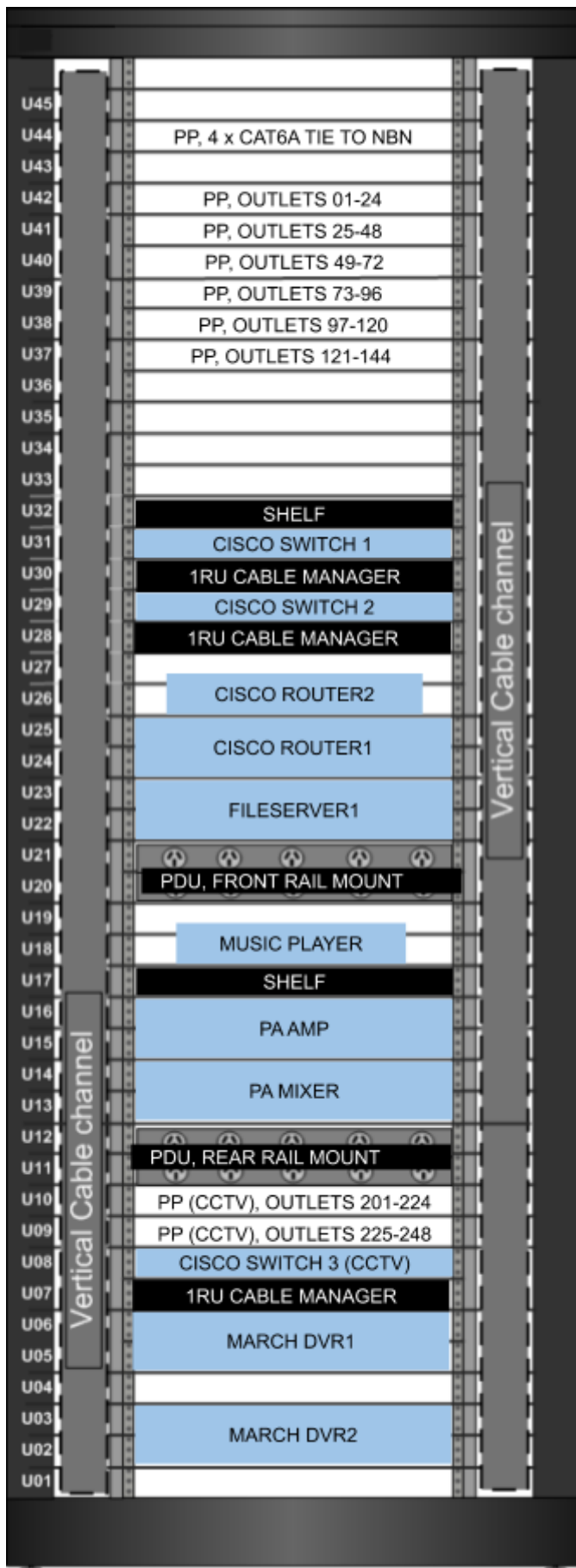


600h x 600w x 600d -
12RU Wall mount (CCTV)



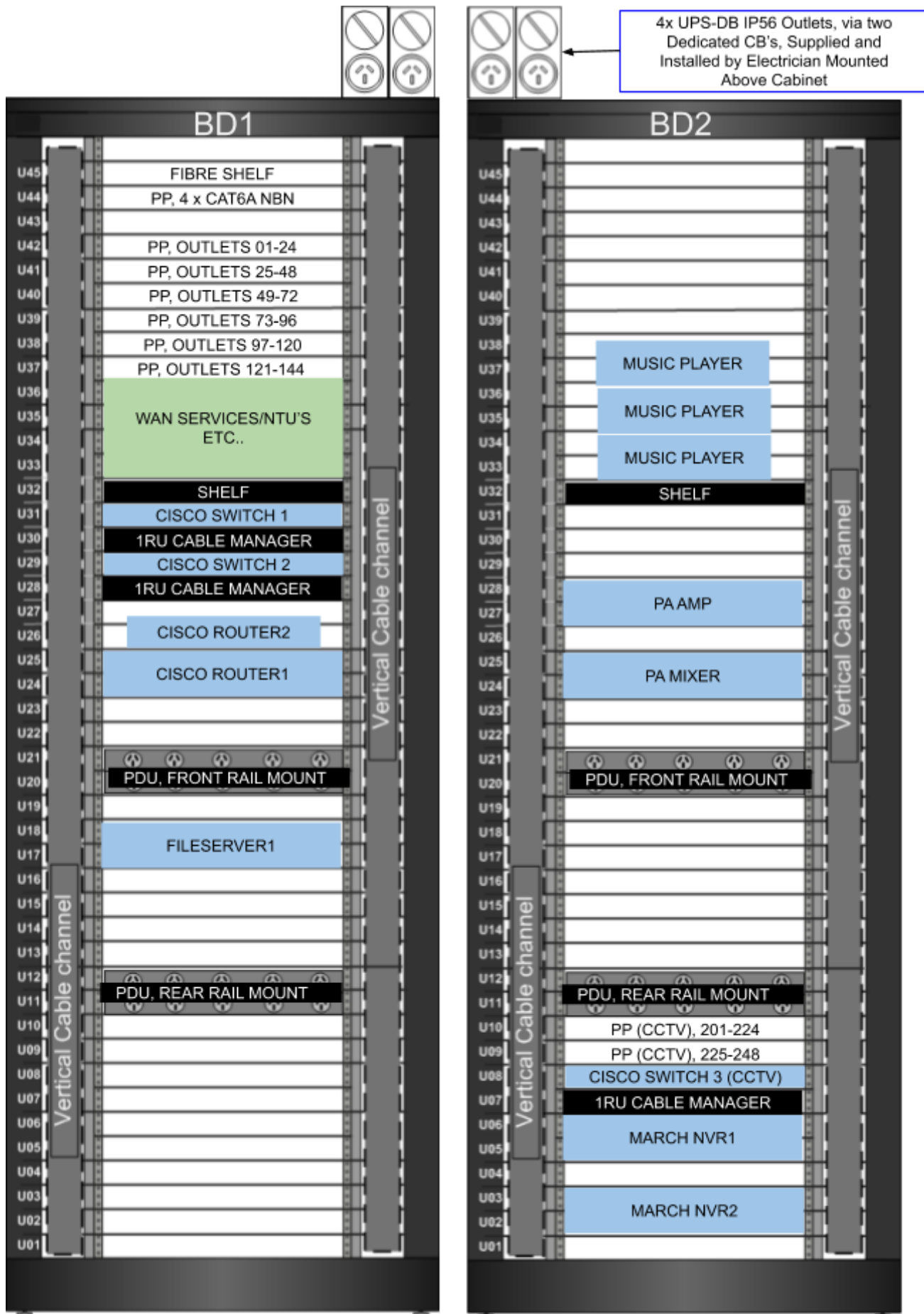
1200h x 600w x 1000d -
22RU Floor mount

5.9 Dan Murphys BD - 45 RU Layout

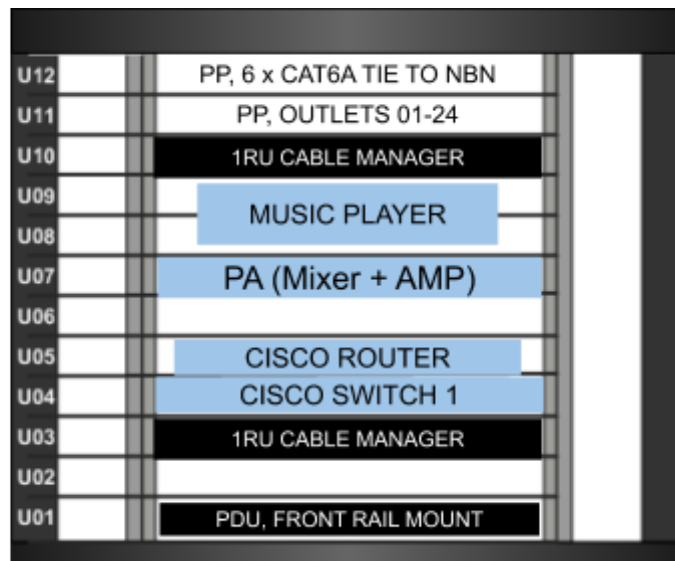


2x UPS-DB IP56 Outlets, via two Dedicated CB's, Supplied and Installed by Electrician Mounted Above Cabinet

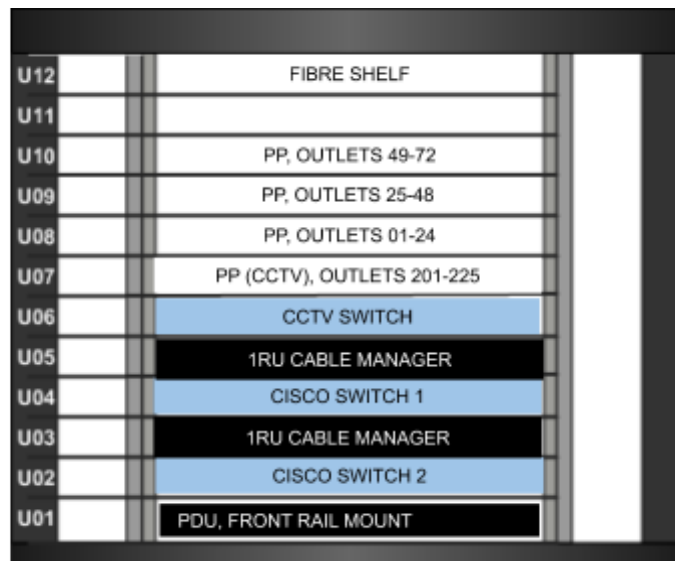
5.10 Big W BD - 45 RU Layout



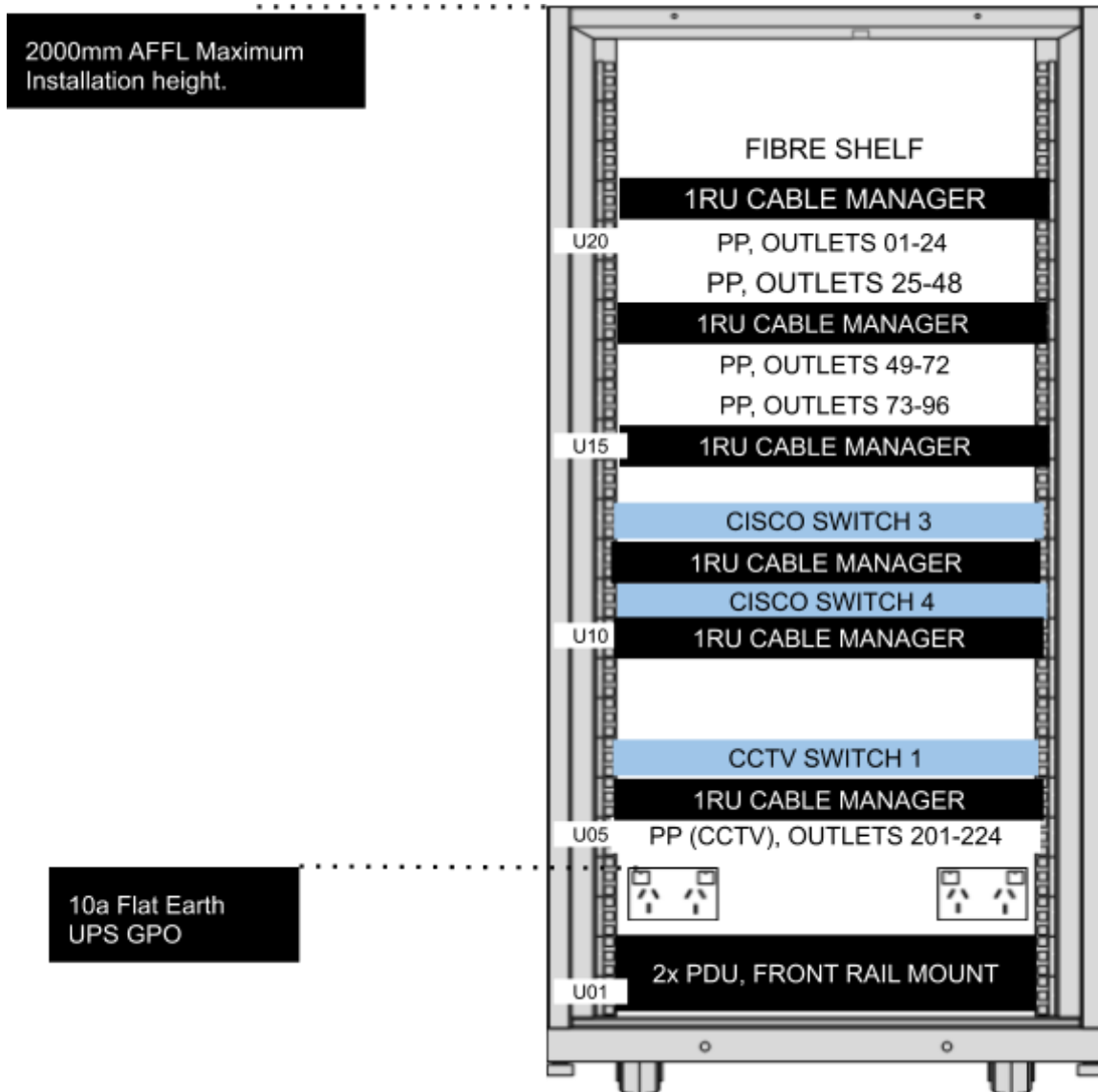
5.11 BWS BD - 12 RU Layout



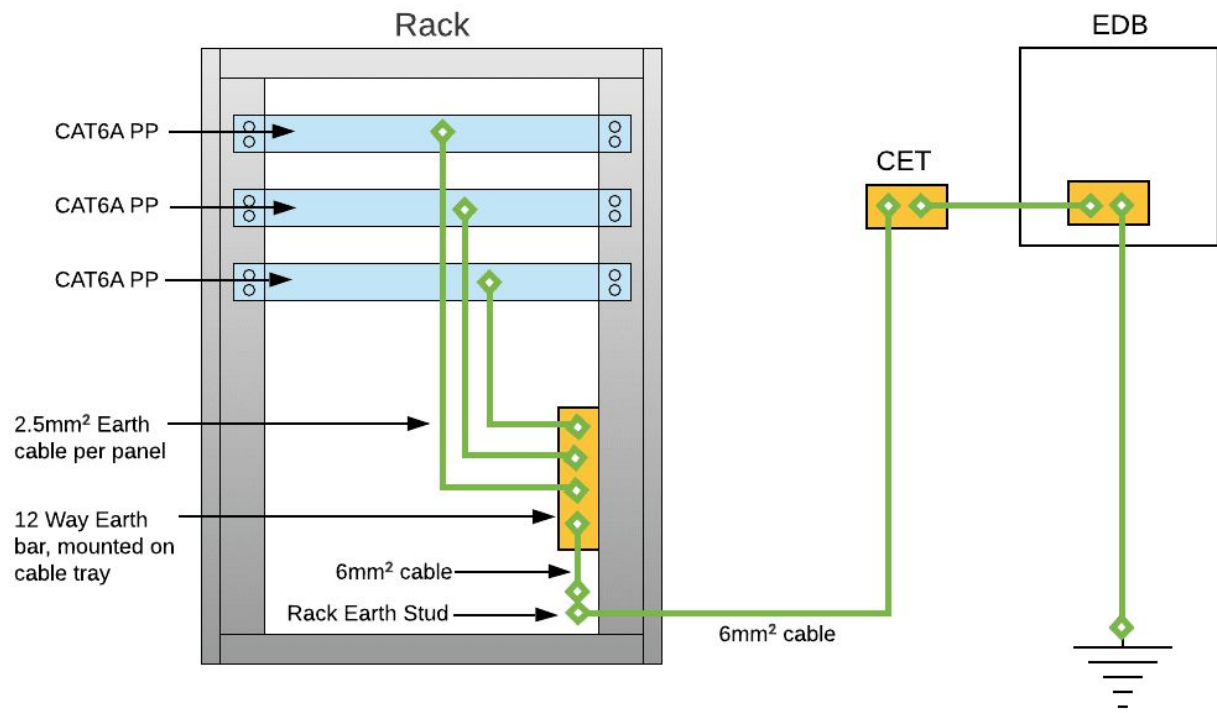
5.12 Big W FD - 12 RU Layout



5.13 All Banners option FD - 24 RU Layout

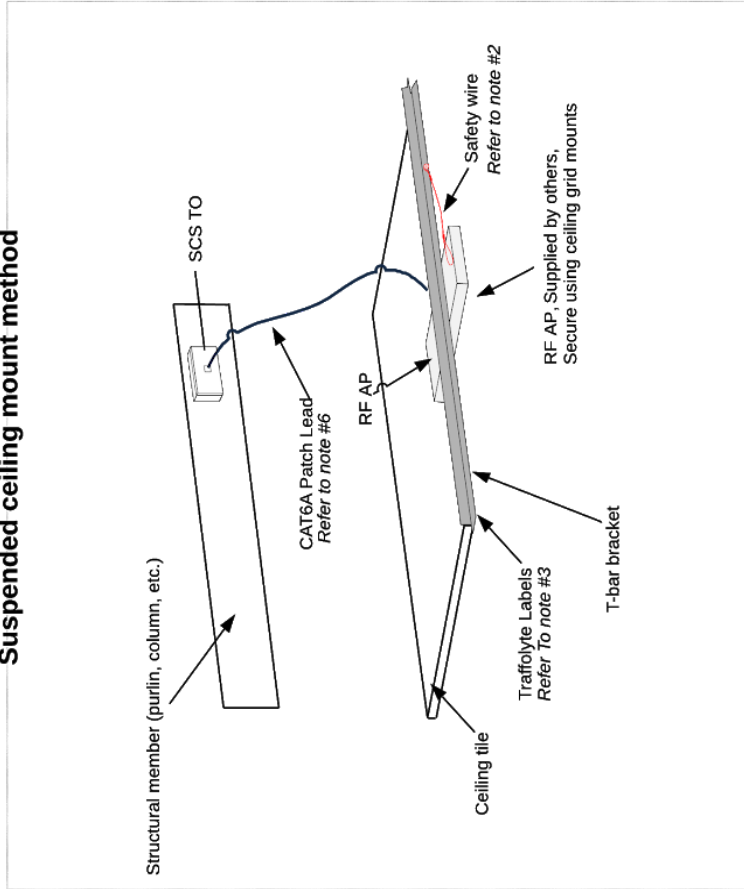


5.14 All Banners - Rack Earthing

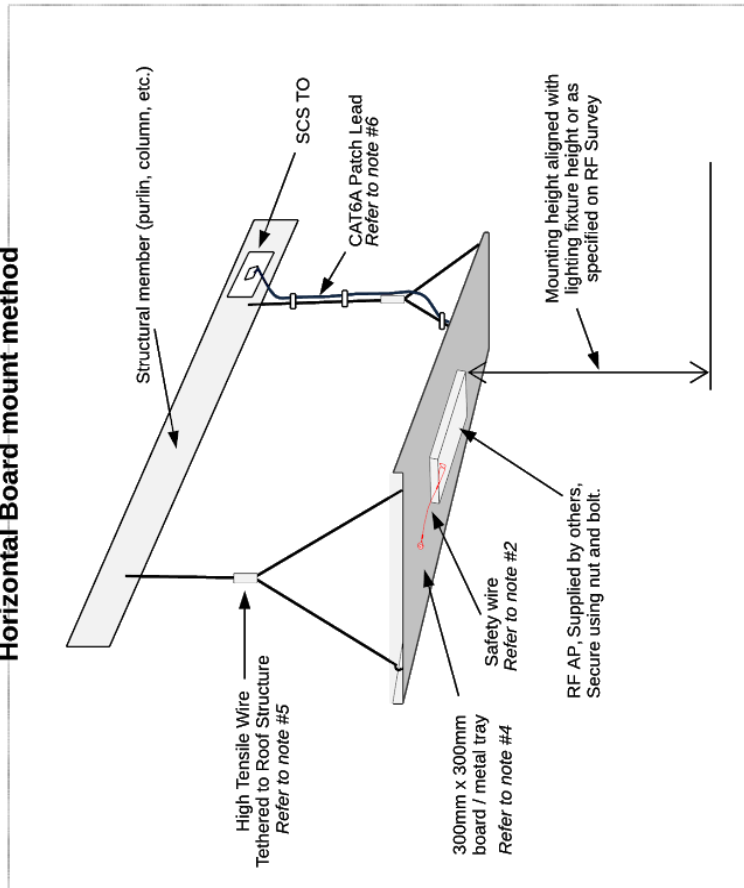


5.15 RF AP Layout - Part A

Suspended ceiling mount method



Horizontal Board mount method

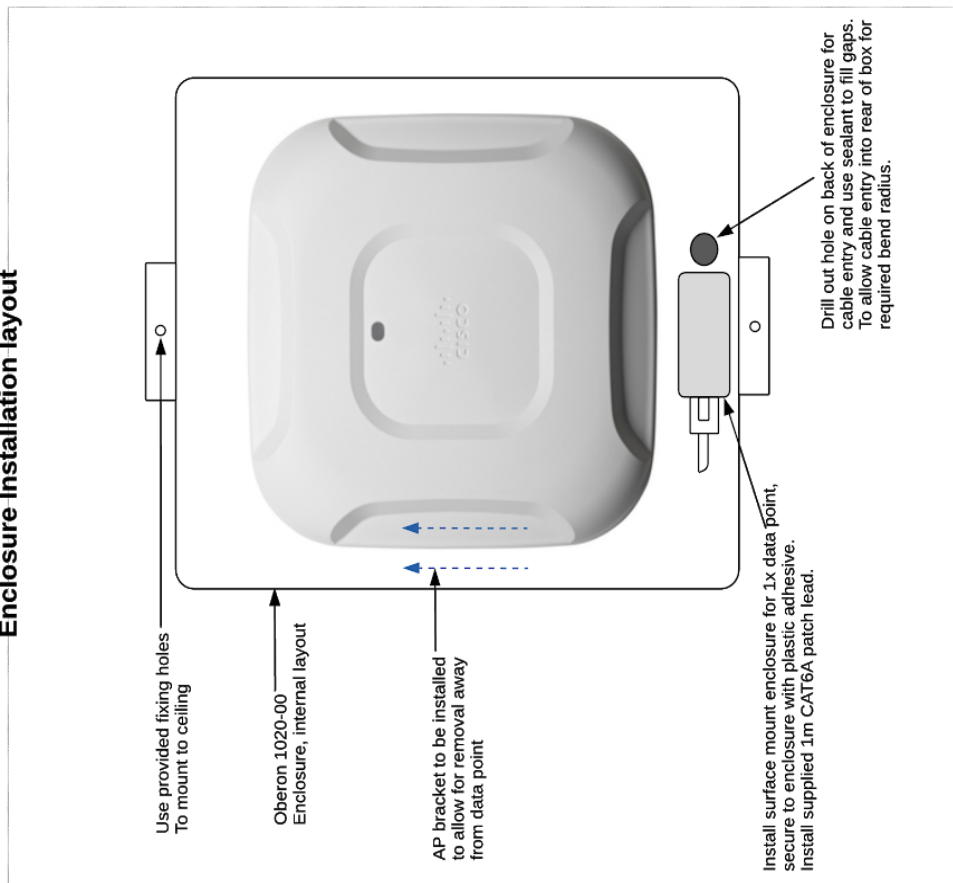


NOTES

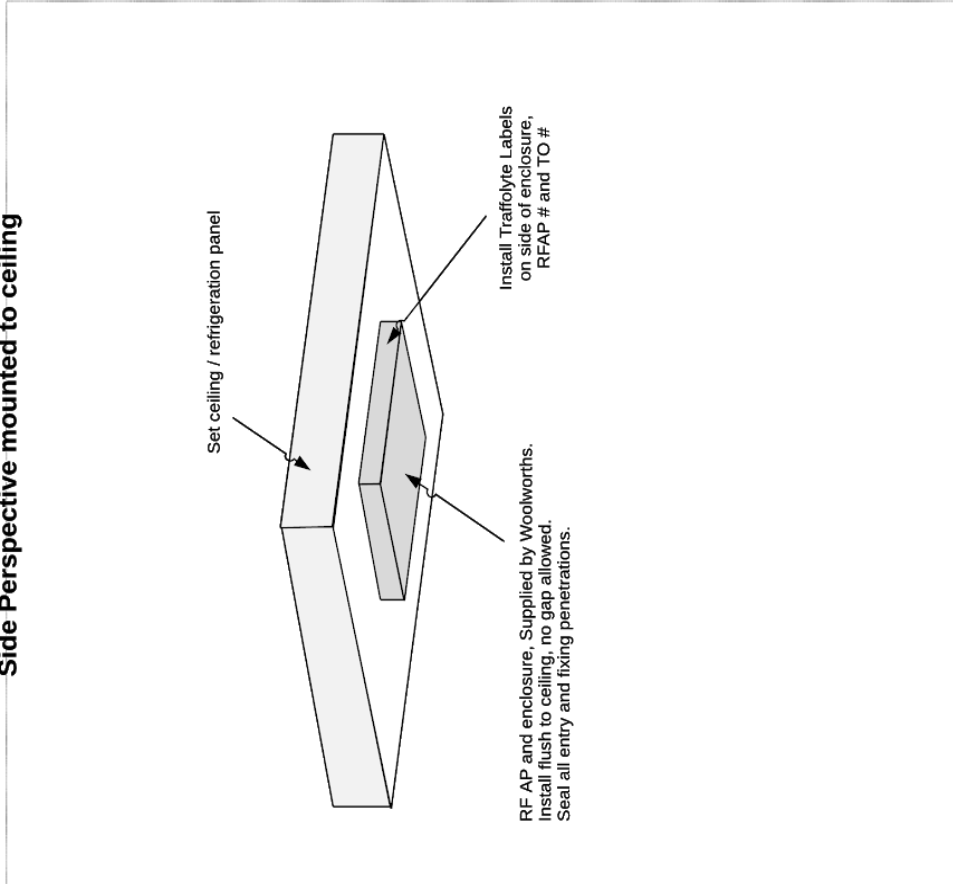
1. All mounting hardware shown is to be installed by the SCS Contractor, Utilising the appropriate method of installation for the environment.
2. All Access ports must incorporate a safety wire to prevent accidental dropping. .150mm long, with 20mm loops at each end.
3. RF AP Traffolyte label to be attached to the cable tray or to ceiling grid directly under RF AP location. Labelling as per SCS Specification.
4. Tray to be painted to suit ceiling colour scheme (Eg white or black)
5. Wire to be supported using Gripple hangers. Alternatively to wire, 2 x threaded rods bolted to the centre point of each end of the tray may be used where required.
6. Contractor to install. Cable slack looped and placed on tray, or tied up where above a ceiling tile.

5.16 RF AP Layout - Part B

Enclosure Installation layout



Side Perspective mounted to ceiling



6.0 Document Control

The following section contains the version release information with description of the key changes made to the document. The reviewers, approvers and distribution lists are presented in this section.

6.1 Document Versions

Version	Date	Author	Comments
0.1	08/11/19	Elie Nahmy	Commenced documentation
0.2	22/06/2020	David Ballard	Changed to reflect store environment
0.3	17/07/2020	David Ballard	Peer and Vendor Review changes
0.4	07/09/2020	David Ballard	Added renewal / project scope rules

6.2 Document Approval

Name	Role	Date
ISA Approval	Infrastructure Standards Authority	10/08/2020
Lukas Herberstein	Manager Technical Architect	10/08/2020
Jeff Black	Senior Manager Stores Infrastructure Engineering	17/07/2020
David Kummerow	Head of Infrastructure - Architecture	05/07/2020
Chris Milburn	Senior Manager - Store Services	17/07/2020
Ben Geldenhuys	Senior Manager Network Operations	10/08/2020

6.3 Document Review & Input

Name	Role	Review Date
George Mobbs	Technical Architecture	27/07/2020
Stephen Martin	Service Delivery Specialist - Telecommunications	20/07/2020
Fred Maranhao	Product Owner - Logistics	17/07/2020
David Ballard	Infra Engineer - Stores	17/07/2020
Tim Phung	National Electrical Engineer	21/07/2020
Mark O Donovan	Stores EUD Product Owner	10/08/2020
Murray Teale	Director, VTI Services	15/07/2020