



**THE UNIVERSITY OF  
MELBOURNE**

**INFORMATION TECHNOLOGY SERVICES**

**COMPUTER AND NETWORK ACCOMMODATION  
STRATEGY  
("CANAS")**

***Generic Needs Brief***

***Revision – E  
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## 1. Introduction

This document defines the generic user requirements for each of the classifications of computer and network accommodation to be provided at the University of Melbourne.

The classifications cover a range of different situations ranging from communications cupboards to Data Centres, and are given in the following table.

<i>Acronym</i>	<i>Expansion</i>	<i>Description</i>
T1	Type 1	Main data centres containing many different computing systems and backbone network switches, and having high levels of redundancy. An example is 258 Queensberry St.
NaTH-1	<b>Network and Telecommunications Hub-1</b>	A major communications hub on the backbone Optical Fibre network feeding a number of buildings with NaTH-2 rooms. It may also contain a number of computing systems. An example is Law 1.
T2	Type 2	Dedicated computer rooms without backbone network switches. They are similar to NaTH-1, but require less monitoring and mechanical systems redundancy. A current example is SEECs.
NaTH-2	<b>Network and Telecommunications Hub-2</b>	A main building communications hub usually feeding a number of floor based switches in NaTH-3 rooms.
NaTH-3	<b>Network and Telecommunications Hub-3</b>	Usually a room feeding a single or multiple floors in the building.

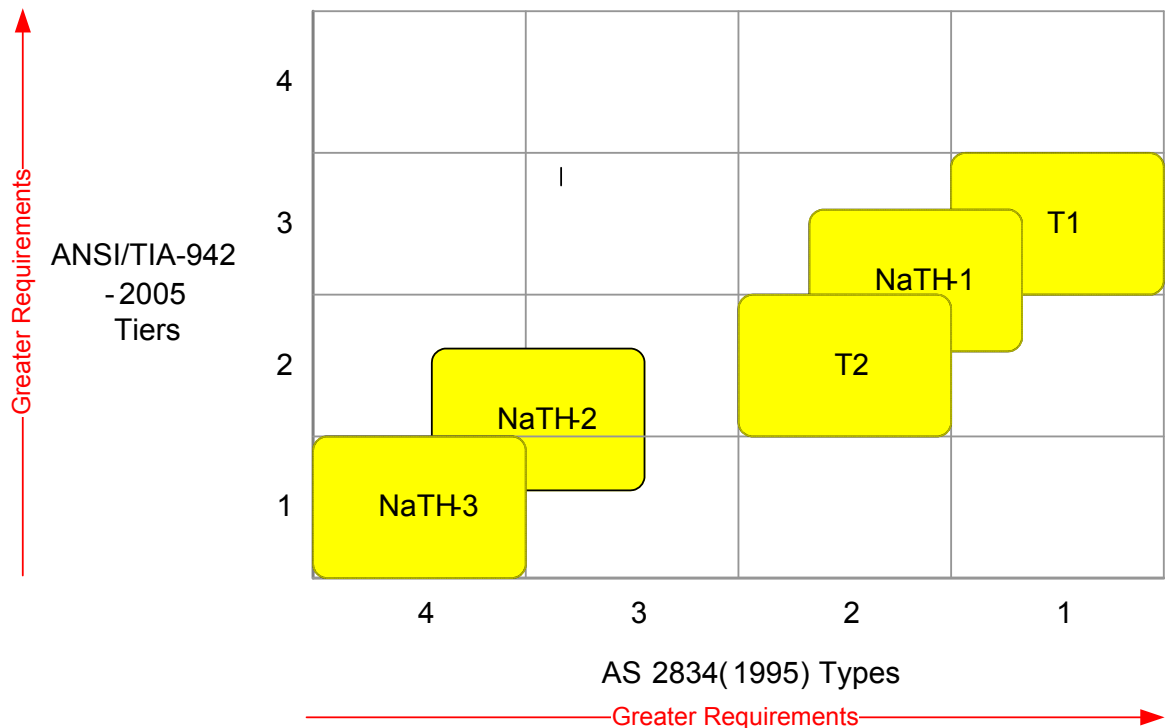
Two different standards have been used in defining the requirements for each of these classifications. They are:

- AS2834 (1995) &
- ANSI/TIA-942-2005

The relationship between the classifications and the levels or tiers specified in these two standards is shown on the following page.

Note: These standards are developed and agreed according to needs, which do change over time. They have been developed by Information Technology Services with Property and Campus Services input, and this version and major updates are ratified and approved through a suitable process.

### The Accommodation Standards Compared



### 1.1. Glossary and Abbreviations

Term	Meaning
ANSI	American National Standards Institute
BD	Building Distributor for incoming communications services
Cat 6	Category 6 cabling
CRAC	Computer Room Air Conditioner
FFL	Finished Floor Level
FIP	Fire Indicator Panel
GPO	General Power Outlet
ID	Information Division
IPP	IPP Consulting
IT	Information Technology
N	Number of units to perform a function
2N	Twice the number of units required to perform a function (i.e. 100% redundancy)
N+1	Number of units to perform a function plus one additional spare unit.
P&CS	Properties and Campus Services
PABX	Private Automatic Branch Exchange
PIN	Personal Identification Number
RU	Rack Unit – a unit of vertical space in a computer rack
TIA	Telecommunications Industry Association

<b>Term</b>	<b>Meaning</b>
TPF	Test Point Frame
UoM	University of Melbourne
UPS	Uninterruptible Power Supply
UTP	Unshielded Twisted Pair (e.g. Cat 6 cabling)
VESDA	Very Early Smoke Detection Apparatus

## **2. Background and context**

The University requires a resilient infrastructure to match the heightened reliance of the University's business on electronic systems, particularly learning management, student information and management systems, e-research and publishing management.

As such, all aspects of design and construction shall, as a minimum, comply with the relevant Australian Standards, as well as ANSI/TIA-942. These include (but are not limited to) the following: AS2834 (computer accommodation), AS1428, AS4154, AS4155, AS3080, AS3084, AS3000, AS2293, AS1680, AS4214, AS2444, AS1850, AS2118, AS1905, AS1670, AS1768, AS1668, AS1020, AS2201 and AS2107.

Item	Question / Description	Details / Comments	NaTH-3	NaTH-2	Type 2	NaTH-1	Type 1
<b>3. Standards</b>							
3.1	Equivalent Australian Standard 2834 Type		Type 4	Type 3 / 4	Type 2	Type 2	Type 1
3.2	Equivalent TIA-942 Tier		Tier 1	Tier 1	Tier 1/2	Tier 2	Tier 3
<b>4. Architectural/Building</b>							
<b>4.1. General</b>							
4.1.1	Example		Communications cupboard.	Building switch room	Server rooms	Major network nodes	Main Datacenters.
4.1.2	Location within building		Approximately one per floor, central	One per building, usually Ground or Basement	Preferably away from exterior walls.		Level, back from outer walls and windows etc.
4.1.3	Proximity to service risers, goods lift etc.		Easy access to service risers				
4.1.4	Aspect ratio	Length / width. 1.0 to 1.5 is recommended.	N/A		Maximum of 1:1.5 is strongly recommended		Contiguous space, may exceed 1:1.15
4.1.5	Room Size	m <sup>2</sup>	Typically 3 to 4m <sup>2</sup>	Typically 5 to 10m <sup>2</sup>	Typically up to 100m <sup>2</sup>	Typically up to 40m <sup>2</sup>	Typically 500 to 600m <sup>2</sup>
4.1.6	General level of fire rating		2 hours				
4.1.7	Dual-fed campus optical fibre services		N/A	Yes - From separate cable pathways into buildings.			
4.1.8	Building external perimeter security	To P&CS standards, with appropriate security across any external windows.	N/A	Yes			All external glazing to have bars and alarms. Separate street address and reception. Secure car parking for out of hours staff for safety.
4.1.9	Building goods access	Access to enable delivery of 45RU equipment racks.	N/A	Yes			Access to loading bay space 24/7 for deliveries.
4.1.10	Other requirements	Adequate turning space needs to be allowed around ramps and entrance doors	N/A		Yes		
4.1.11	Plant Ante room		N/A		Site specific.		
<b>4.2. Floors</b>							
4.2.1	If exposed, painted?		Yes and sealed				
4.2.2	Sealed against ingress of water		Site specific. Particularly important for basement areas.				
4.2.3	Floor surface		Dust & lint free, eg. No	Anti-static Vinyl.			

Item	Question / Description	Details / Comments	NaTH-3	NaTH-2	Type 2	NaTH-1	Type 1
			carpet				
4.2.4	Anti static measures		None		Yes - anti static mat, dirt collecting mat.		
4.2.5	Raised floor?		N/A		Optional, but preferable		Yes
4.2.6	Access floor height		N/A		300 mm from slab to FFL		600 mm from slab to FFL
4.2.7	Tile dimensions / grid		N/A		600 mm x 600 mm		
4.2.8	Air plenum under floor		N/A		Site Specific		Yes
4.2.9	Tiles along walls shall be able to be lifted		N/A		Yes		
4.2.10	Tile supports		N/A		Heavy duty, bolted stringers. Must be able to be removed when needed.		
4.2.11	Maximum tile weight	For uniformity, all tiles should be of the type as those used in the 258Q Datacentre	N/A		10 Kg		
4.2.12	Tile surface		N/A		High pressure laminate		
4.2.13	Surface colour		N/A		Light		
4.2.14	Edge strips on perimeter of floor tiles		N/A		Yes		
4.2.15	Ramp required		N/A		Yes. Removable type is acceptable		Yes
4.2.16	Carpet floor tiles on top		N/A		No		
4.2.17	Average load per rack		N/A		200Kg		
4.2.18	Maximum load per rack		N/A		400 Kg per 600 mm x 600 mm floor tile, also site specific		
4.2.19	Maximum point load (e.g. from tape silo etc.)		N/A		200 Kg (based on 800 Kg item with four (4) corner feet).		
4.2.20	Number of vented tiles (underfloor cooled locations only)	Vents to feature adjustable air flow rate as well as front to back directional control (i.e. ability to be biased to flow towards or away from a rack.	N/A		One (1) per planned rack space.		
4.2.21	Number of cut tiles	Vents to be 1/3 tile size.	N/A		Site Specific		
4.2.22	Tile cut - shape(s)		N/A		Site Specific		
4.2.23	Tile cuts to be vinyl edged		N/A		Yes - this is critical to prevent damage to power cables.		
4.2.24	Number of spare cut tiles required		N/A		Site specific.		
4.2.25	Number of spare uncut tiles required		N/A		One per 30 square metres or part thereof.		
4.2.26	Tile Lifter	With wall mounting rack.	N/A		One (1)		Two (2)
4.2.27	Earthing		N/A		Earthing for all floor supports, Racks, BD, TPF.		

Item	Question / Description	Details / Comments	NaTH-3	NaTH-2	Type 2	NaTH-1	Type 1	
<b>4.3. Walls</b>								
4.3.1	Room walls to extend from floor slab to roof slab		N/A		As required for fire rating			
4.3.2	Room walls to be fire rated		Yes –2 hours					Yes - 2 hours on security perimeter.
4.3.3	Acoustic properties	Specific provisions should be made to reduce noise levels from 80db inside to 40db - 45db outside, depending on the adjacent occupancy.						
4.3.4	Room walls painted		If exposed to seal against dust.		Yes			
4.3.5	Paint type & colour		N/A		Semi-gloss			
4.3.6	Sealed against ingress of water	Site specific. Particularly important for basement areas.						
<b>4.4. Ceiling</b>								
4.4.1	Suspended or fixed ceiling required?	No						
4.4.2	If exposed, painted?	Yes and sealed						
4.4.3	False ceiling type	If in place must be suspended, not fixed.						
4.4.4	Height – access floor to first obstruction (minimum)	No minimum	2300mm	2700 mm				
4.4.5	Any particularly tall equipment	None	45RU rack plus pallet plus jack					
4.4.6	Acoustic properties	Specific provisions should be made to reduce noise levels from 80db inside to 40db - 45db outside, depending on the adjacent occupancy.						
4.4.7	Ceiling membrane to protect from leaks	Where there is a risk of water permeating the ceiling or plumbing services.						
4.4.8	Power cable tray space required	Site specific		Yes		No - Bus ducts		
4.4.9	Data cable tray / catenary space required	Yes – refer to University of Melbourne Standards for the installation of voice and data cabling.						
<b>4.5. Furniture</b>								
4.5.1	New equipment racks required	N/A		Site specific.				
4.5.2	Size	N/A		Site specific.				
4.5.3	Modular computer furniture e.g. Wrightline	N/A		Site specific.				
4.5.4	Linear meters	N/A		Site specific.				
4.5.5	Chairs-quantity	N/A		Site specific.				
4.5.6	Workstations-quantity	N/A		Site specific.				
4.5.7	Other furniture	N/A		Site specific.				

Item	Question / Description	Details / Comments	NaTH-3	NaTH-2	Type 2	NaTH-1	Type 1
<b>4.6. Doors</b>							
4.6.1	Number of doors		Minimum of one				Minimum of two (2), one for routine access and one for emergency egress.
4.6.2	Door control	Key/access control	Proximity card			External doors prox and PIN, internal doors prox.	
4.6.3	Doors to be normally	Locked/unlocked	Locked				
4.6.4	Door width	1800 mm recommended with 900 mm minimum	Minimum of 900 mm		Minimum of 1350 mm		Main doors 1800mm, emergency egress doors as per standard.
4.6.5	Door Height		N/A		Floor to ceiling preferred		
4.6.6	Cat & kitten style		N/A		Yes		
4.6.7	“Latch” type door hinge		Yes				
4.6.8	Acoustic properties		Specific provisions should be made to reduce noise levels from 80db inside to 40db - 45db outside, depending on the adjacent occupancy.				
<b>5. Mechanical Services</b>							
5.1	Equipment heat load		Site specific.		400 watts per square metre.		800 watts per square metre.
5.2	Independent of base building chilled water system		N/A		Yes		
5.3	Underfloor cooling		No		Site Specific		Yes
5.4	Redundancy		No		Yes - N+1	CRAC - N + 2	
5.5	Modular system to allow additional units to be added later		N/A		Yes		
5.6	Computer Room Pressurisation		None		Yes, positive pressure to prevent dust ingress.		
5.7	Run off base building generator		Yes, if available			No, separate generator	
5.8	Cooling method	Air/Water/Dry condenser	Any				Air
5.9	Self resetable		N/A		Yes - so that staff can keep system operating whilst waiting for help.		
5.10	Automatic dial out		N/A		Yes		
5.11	Fire dampers for supply and return air ducting		N/A		Yes		
5.12	Interface control panel to EMS		N/A		Yes		
5.13	Other requirements	Details to be provided	None		Room to be laid out in a hot/cold isle arrangement.		Return air ducting to be provided over the hot isles.

Item	Question / Description	Details / Comments	NaTH-3	NaTH-2	Type 2	NaTH-1	Type 1	
<b>6. Electrical Services</b>								
<b>6.1. Lighting</b>								
6.1.1	Grid pattern		N/A		Yes - Design to minimize shadows and provide maximum light into the racks.			
6.1.2	Lighting on the generator		Yes, as per standard					
<b>6.2. Power</b>								
6.2.1	Dual feed from electrical supplier		No		Yes, if available.		Yes	
6.2.2	Operating capacity	KW	Site specific		400 watts per square metre.		800 watts per square metre.	
6.2.3	Electrical outlets - type	Screw down, captive	Captive				Power bus duct	
6.2.4	Electrical outlets per rack		2 x 32A		2 x 32 Amp, each from differing power phases.	2 x 32 Amp, one from each power distribution board.		
6.2.5	Outlets location relative to racks		Behind		Behind if under floor, otherwise above.		Behind	
6.2.6	One circuit per power outlet		Yes					
6.2.7	GPO	Quantities to be advised at detailed design stage			Two types of GPOs required: 1) Essential supply GPOs, with RED faceplates 2) Non-essential supply GPOs to have white faceplates. 2 x double GPOs of each type at either end of room.			
6.2.8	UPS		Yes		Yes. Minimum 12 pulse model, with harmonics treatment, designed to handle leading power loads found in switched mode computer power supplies.			
6.2.9	UPS battery design life	Regular or Long Life	Long Life					
6.2.10	UPS Power in/out	1 or 3 phase	Single Phase		3 phase / 3 phase			
6.2.11	UPS Redundancy	N / N+1 / N+2 / 2N	N			2N		
6.2.12	UPS Minutes of backup		20 minutes					
6.2.13	UPS SNMP interface for remote monitoring		Yes					
6.2.14	Interface UPS to environmental monitoring panel		N/A		Yes			
6.2.15	Emergency stop button		N/A		Yes, with cover and double action.			
6.2.16	Generators independent of base building		None			Yes - One (1)	Yes - Two (2)	
6.2.17	Generator capacity to suit (base or independent)		All of room where base building generator is available.			All of room.		
6.2.18	Generator fuel tank quantities (base or independent)		N/A		24 hours if base building generator available.	Three (3) days, contingent on assured fuel delivery contract.		

Item	Question / Description	Details / Comments	NaTH-3	NaTH-2	Type 2	NaTH-1	Type 1	
6.2.19	Server shutdown software		Yes		No if base building generator available.	No		
6.2.20	Generator Testing		As per maintenance schedule.			Monthly. Controls within the Computer Room to allow for generator testing and power maintenance activities. Generator status indication to be provided in Computer Room and Gatekeeper area.		
<b>6.3. Earthing</b>								
6.3.1	Each cabinet to be separately earthed	6mm earth strap from nearest board to first rack terminating on an earth bar. Additional racks connected to earth bar by a 4mm earth strap			Yes			
6.3.2	Other Items		Cable trays, BD, TPF, modular furniture & access floor supports.					
6.3.3	TRC required		Only for NaTH-1 sites with a PABX.					
<b>6.4. Lightning</b>								
6.4.1	Building protection		As per standard.					
6.4.2	Electrical mains protection		Yes, prior to UPS bypass switching.					
<b>6.5. Power Cabling</b>								
6.5.1	Cable tray to be supplied by electrical contractor		Yes				Yes - Bus duct.	
6.5.2	Separate cable trays for electrical and data		Yes					
6.5.3	As built drawings of cable tray and cable routes		No	Yes				
6.5.4	Overhead cable tray route separation		Must maintain separation from electrical and light fixtures of at least 0.6m					
<b>7. Fire Protection</b>								
7.1	General level of fire rating – walls, doors		2 hour				2 hours on Data Centre security perimeter.	
7.2	Gas fire suppression system	To be equipped with manual fire gas and stop gas capability.	None				Yes - bottles to be close to Computer room. To be linked to emergency power shunt trip to isolate power if the gas is to be dumped.	
7.3	Concealed gas heads		N/A				Yes	

Item	Question / Description	Details / Comments	NaTH-3	NaTH-2	Type 2	NaTH-1	Type 1
7.4	<b>Sprinkler type</b>	Pre-action/wet	Wet pipe or none, ref building code.		Pre-action or none, ref building code.		Pre-action
7.5	<b>Below ceiling sprinklers</b>		Yes, where fitted.				Yes
7.6	<b>Under floor sprinklers</b>		No				Yes
7.7	<b>Smoke detectors</b>		Yes - Both ionization and obscuration sensors within a smoke detector to be in alarm before the smoke detector raises an alarm to the FIP.				
7.8	<b>Portable fire extinguishers</b>		Yes - High Voltage foam type. Dry chemical or CO <sub>2</sub> extinguishers are NOT to be supplied for use within the target areas.				
7.9	<b>Smoke detectors location</b>	As per code	Yes				
7.10	<b>VESDA – stages</b>	One to Four	None required.		3 Stage alarm		4 stage alarm
7.11	<b>VESDA – sampling points</b>		N/A		Sampling point locations by fire services engineer.		
7.12	<b>VESDA – linkages</b>		N/A		Smoke detectors and sprinklers are to perform their actions independent of the VESDA system.		
7.13	<b>VESDA – panel location</b>	Inside the room.	N/A		Inside the room.		Inside the main Data Centre security perimeter.
7.14	<b>Fire Indicator Panel (FIP) - VESDA interworking</b>		N/A		Interfaced to VESDA and mechanical system (dampers). Connected to computer room smoke detector.		
7.15	<b>FIP - connections</b>		N/A		Connected to computer room smoke detector. Interfaced to mechanical system (dampers) as specified by the fire services engineer.		
7.16	<b>FIP - Location</b>		N/A		Sub-fire indicator panel located outside Computer Room door.		
7.17	<b>Other requirements</b>		None		Provide an external air quality sampler input into the Fire system - fire services engineer to detail.		
<b>8. Security Services</b>							
8.1	<b>Standalone system</b>		No, use standard UoM system			Yes, with interface to UoM system.	
8.2	<b>Remote monitoring</b>		None			Yes - To be accessible remotely for both monitoring and control.	
8.3	<b>Proximity cards</b>		Yes				
8.4	<b>Staff duress alarm</b>		No				Yes
8.5	<b>Hold open door alarms</b>		None		Yes		
8.6	<b>Intrusion detection above ceiling grid</b>		None				

Item	Question / Description	Details / Comments	NaTH-3	NaTH-2	Type 2	NaTH-1	Type 1
8.7	Cable tray routes to be secure from tampering		Yes, outside of the room.				Yes, outside of the Data Centre security area.
8.8	CCTV monitoring of computer room		None	Yes – IP based with remote monitoring.			
8.9	Recorded		None	Yes			
8.10	Operations to be able to reset audible alarms		N/A	Yes			
8.11	Signage level		Room number only				None
<b>9. Environmental Monitoring System Services</b>							
9.1	Environmental monitoring system required		No	Yes			
9.2	Computer based system		N/A	Yes			
9.3	Mechanical system integration		N/A	Yes			
9.4	Notification method		N/A	Email, pager, SMS messaging			
9.5	Room temperature warning		N/A	Yes - High and low alarm.			
9.6	Room humidity warning		N/A	Yes - High and low alarm.			
9.7	Room underfloor temperature warning		N/A	Yes - High and low alarm.			
9.8	Under floor detection of water alarm		N/A	Yes			
9.9	Mains supply failure		N/A	Yes			
9.10	Mains supply voltage		N/A	Yes - High and low alarm.			
9.11	UPS alarm		N/A	Yes			
9.12	UPS battery low		N/A	Yes			
9.13	UPS on bypass		N/A	Yes			
9.14	Air conditioning unit fault		N/A	Yes			
9.15	Under floor water alarm		N/A	Yes			
9.16	Emergency power off button activated		N/A	Yes			
9.17	Air conditioning plant failed		N/A	Yes			
9.18	Generator running		N/A	Yes if supplied	Yes		
9.19	Generator alarms		N/A	Yes if supplied	Yes - Fault, low oil pressure, low fuel level, over temperature, starter system fault.		
9.20	Fire warning from FIP		Strobe Light connected to EWIS		Yes		
9.21	Fire warning from VESDA		N/A	Yes			
9.22	Gas suppression system activation		N/A		Yes		
9.23	Gas fire suppression system manual stop activated		N/A		Yes		
9.24	Gas fire suppression exhaust purging system		N/A		Yes		

Item	Question / Description	Details / Comments	NaTH-3	NaTH-2	Type 2	NaTH-1	Type 1
<b>10. <u>Cabling Services</u></b>							
10.1	Client cable standards provided?		Site specific.				
10.2	Power below / cable above style separation?		None		Power below floor, data above racks.		
10.3	Cabling type		Cat 6 Copper and Single Mode Optical Fibre - refer to University of Melbourne Standards for the installation of voice and data cabling Cat 6 and Single and/or Multi-mode Optical Fibre.				
10.4	Preferred Brand		Refer to the University of Melbourne Standards for the installation of voice and data cabling.				
10.5	Quantity of outlets to each rack		Site specific.				
10.6	Termination type		Refer to the University of Melbourne Standards for the installation of voice and data cabling				
<b>11. <u>Other Requirements</u></b>							
11.1	In room telephone		None		Yes, cordless phone required		
11.2	Additional telephone lines		None		Yes one for the EMS and one for the mechanical services alarms.		
11.3	Equipment maintenance		Maintenance for a minimum of 12 months to be purchased with major capital items such as UPS, Generators, Mechanical services and similar				

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