CURTIN UNIVERSITY

PROJECT DELIVERY GUIDELINES

AUDIOVISUAL GUIDELINES PART 5 – PROJECT PROCESSES

000320

Curtin University

TEACHING, LEARNING AND MEETING SPACES

ABSTRACT

The purpose of this document is to clearly define a standard set of processes for conducting audiovisual system installations for teaching, learning and meeting spaces at Curtin University.

Details of revisions			
Level	***Details***	***Date***	***Initial***
1	*Original document created from Audio Visual Standards Part 5 - Project Processes (v0.4)*	*Dec-16*	*RPS*
2	*Overall review of content. Minor modifications and updates including document access location.*	*Jun-18*	*IRC*

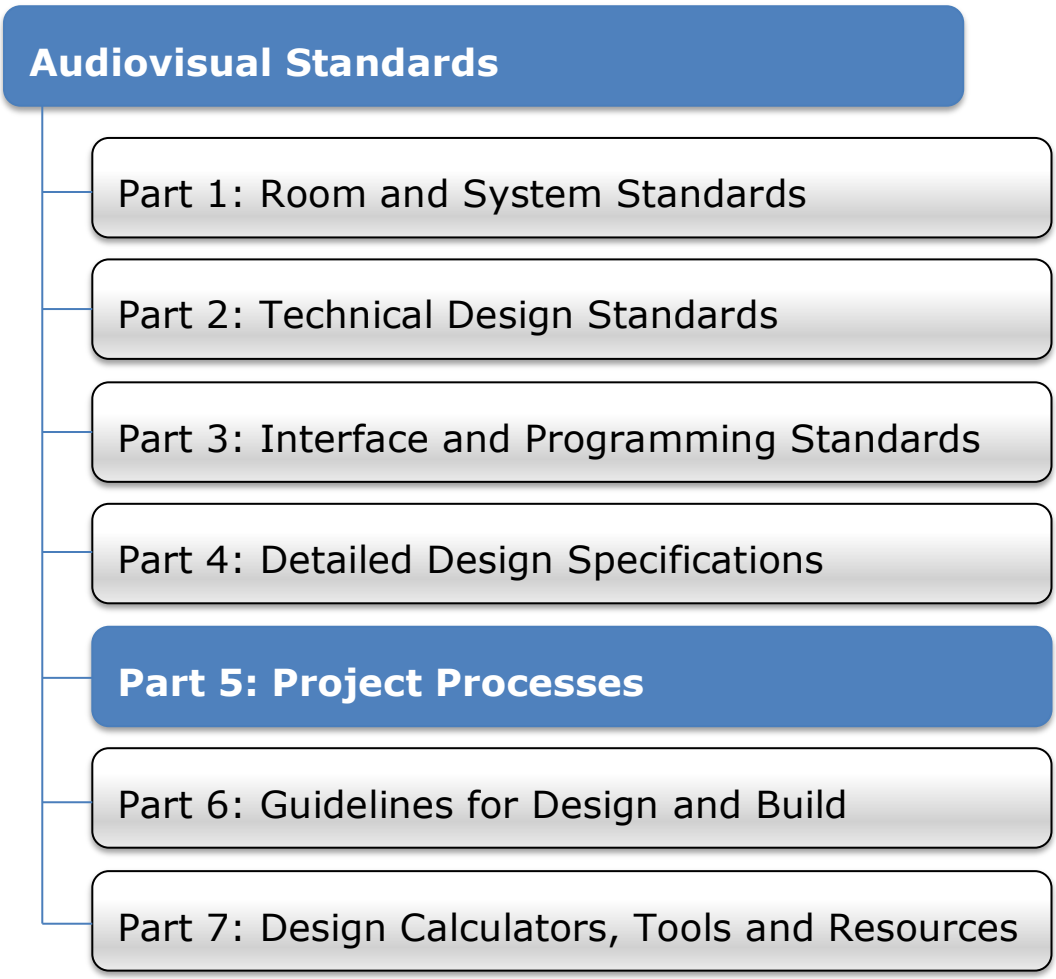
CONTENTS

LIST OF TABLES

RELATED DOCUMENTS

Title	Version	Date	Location
Standard Guide for Audiovisual Design and Coordination Processes - ANSI/InfoComm	2M-2010	2010	Infocomm website

Audiovisual Standards Part 5 - Project Processes



1 INTRODUCTION

1.1 DOCUMENT BRIEF

This document provides definition and description of the methods, procedures, tasks and deliverables to be applied in the delivery of audiovisual (AV) systems for teaching, learning and meeting spaces at Curtin University. The intended audience is specialist professionals such as audiovisual consultants, system integrators and project managers. The standard provides a guideline for defining the audiovisual requirements and a clear accountability structure for the development and construction of AV systems.

The AV systems being installed at Curtin are becoming increasing complex and interconnected to other building systems such as networks, electrical (lighting) and building/energy management infrastructure. The documentation described in this standard should complement related architectural, engineering and construction documentation.

Section 2 describes the roles and responsibilities of the project leadership, team and contributors for the delivery of projects containing one or more audiovisual systems. Project planning and coordination is described in Section 3. The milestones and activities in each of the project phases are described in the remaining sections.

The definitions that apply to this document are listed in the Glossary of Terms in Appendix A.

1.2 DOCUMENT ACCESS

All design and build professionals must ensure they have the most current version of all standards prior to engaging in any work.

The most recent version of this document can be found on the web at: https://properties.curtin.edu.au/workingwithus/guidelines.cfm.

1.3 PROJECT APPROACHES

There are two main project approaches used at Curtin University:

1. **Capital Projects**
   These are projects coordinated through Properties, Facilities and Development (PF&D) where the monetary value is high, typically requiring a tender process, and the design and construction timeframe may be long. An independent AV consultant is appointed to take on the responsibility of successful delivery of the audiovisual systems.
2. **Design/Build Projects**
   These are projects typically coordinated through the CITS–AV Project team where typically standard audiovisual designs are installed as turnkey solutions.

1.4 PROJECT PHASES

The project life cycle described in this standard is based on the multiple phases, from project beginning to end, described in ANSI/InfoComm 2M-2010, *Standard Guide for Audiovisual Design and Coordination Processes*.

1.4.1 BRIEFING PHASE

The purpose of the briefing phase is to discuss, clarify and document the sponsor's requirements and expectations for the functionality and cost of the audiovisual system.

1.4.2 DESIGN PHASE

The purpose of the design phase is to detail the requirements and create the final design documents. These documents should be coordinated with, and reference, those of other trades such as electrical, mechanical and information technology.

1.4.3 CONSTRUCTION PHASE

The purpose of the construction phase is to conduct all of the physical installation and programming works to complete the AV system(s) within the project.

1.4.4 COMMISSIONING AND HANDOVER

The purpose of the commissioning and handover phase is to ensure that the AV system(s) perform to the expectations set out in the design documentation. All components of the system are tested to meet specifications. A user acceptance test is conducted to finalise the handover process. Training is provided to support staff and end users.

1.5 CONTRACTORS TO FULLY SELF INFORM

It is expected in any capital or design/build project that contractors shall fully self-inform and not rely on representations. This includes requirements such as to:

- read necessary documents so referred in contract documentation
- inspect site, conditions and existing installations
- make provision for travel
- check lead times of local and imported equipment to ensure they can be supplied in time
- use supplied templates for touch panel files, network information, venue configuration, digital signal processing, and commissioning
- understand and use the University's global code and version management services.

1.6 UNIFIED CODE

The University will provide access to the source of its unified code, which must be used as the base version for all new programming work. New versions of the unified code must be stored and managed using the University's version control application. There are not to be passwords on custom code modules.

The University must retain full rights to all contractor-developed software provided by the contractor as part of the project. This includes the right to use, reproduce and modify the software as reasonably required to operate the systems and to support their ongoing maintenance and development.

1.7 PROGRAMMING CAPABILITY STATEMENT

Curtin University requires that the programming contractor has demonstrable experience in Curtin's preferred AV controller and is preferably a partner with the supplying vender. The contractor's programmers are required to reside in Perth, Western Australia, in order to be able to attend onsite sessions at Curtin University for the testing and commissioning stages and post-occupancy stages as required, and ensure programming is aligned with Curtin's standards and expectations.

2 ROLES AND RESPONSIBILITIES

The design and construction of a modern learning space requires a collaborative effort by a coordinated project team of internal and external parties. The people or parties who take an active role in the delivery of projects containing one or more audiovisual systems are shown in **Table 1**.

It is essential that the CITS–AV team, through the AV Project Manager, is involved in any project that includes an addition or modification of the university's AV infrastructure. The team is a valuable resource with years of practical experience specific to educational technology. In addition, the CITS–AV team will be supporting the new environment after the project has closed.

Table 1: Project Roles

Role	Description
CITS–AV Project Facilitator	Provides the liaison, consultation and approval contact for external personnel regarding audiovisual specifications
External Project Manager	Provides the overall scheduling and resource management for the building project
Architect	Acts as lead consultant regarding building design and construction
Properties and Facilities Development (PF & D)	Provides the contract management role with consultants and contractors on behalf of the University
Builder	Provides the construction team and resources
Electrical Contractor	Provides the installation of electrical and data under the advice of the Electrical Consultant
AV Standards Manager	Ensures that standard system design and components are incorporated into solutions for the University
AV Consultant	Provides the final audiovisual design, tender specification and oversight on AV system installation
AV Integrator	Provides the AV system installation team and resources. It is preferred if the team manager has at least five years' experience with relevant qualifications including CTS.
Learning and Teaching	Provides consultation on design and final user acceptance testing for AV systems in classrooms
CITS Coordination	Provides the liaison between PF & D and CITS teams
CITS – Networks	Provides the network procurement, installation and configuration services

Role	Description
CITS Desktop	Provides the computer and software procurement, installation and configuration services

The responsibilities of the people and groups in the delivery of capital projects containing audiovisual functionality are shown in the RACI matrix of Appendix D.

For smaller audiovisual design/build projects, the project team doesn't include external resources such as architects and builders. In this case the CITS team takes on the role of AV Consultant and not all the activities shown in the matrix are required.

3 PROJECT PLANNING AND COORDINATION

3.1 MEETINGS AND COMMUNICATION

The project framework will typically specify the number, length and location of meetings in the Project Communication Plan. For capital projects, a Project Control Group (PCG) is the mechanism for coordination of trades and personnel involved.

3.2 PROJECT ARTEFACTS

The project will produce a number of artefacts over the duration of the project life cycle. Some of these are listed below and should be maintained on a regular basis and made available to the PCG.

- **Communication Plan** – details the type, audience and frequency of communications over the life of the project e.g. meetings, minutes, status reports (including issues), end-of-phase reports, system and user documentation, close-out report etc.
- **Issues Register** – detailed log of issues, status, assigned owner, resolutions etc.
- **Change Management Plan** – detailed list of items relating to issues and changes and how they will be handled by the project and what items will need to be escalated to Curtin decision-making bodies (e.g. University's Change Advisory Board).

3.3 CRITICAL PATH

Modern audiovisual systems are integrated into the infrastructure and fabric of a building therefore coordination is required during construction with the other trades and professions such as electrical, mechanical and interior design. Much of the preliminary work involving cable runs and communication racks needs to be incorporated into the earlier stages of construction. However, for the majority of AV installation works, the AV Integrator will require a clean site and all other works to be completed before commencing. For this reason the timeframes provided to the AV Integrator are often compressed leading up to practical completion when other construction activities have overrun.

In recognition of this, and to assist builders and project managers understand the process involved, the University has created a critical path process flow and associated narrative for audiovisual system installation, as shown in Appendix B and Appendix C.

3.4 WORKING ONSITE

All contractors are required to complete an online induction before working onsite at the university: http://properties.curtin.edu.au/workingforus/inductions.cfm.

All contractors are required to complete the necessary permits to work onsite such as site access, isolation authority, and high risk activity: http://properties.curtin.edu.au/workingforus/permits.cfm.

3.5 UNIVERSITY ASSOCIATE

Where deemed necessary by the CITS–AV Project Facilitator, members of the AV Integrator team, such as the programmer, can be provided with University Associate status. This gives that member a Curtin ID number and password for accessing control systems and other networked devices.

4 BRIEFING PHASE

4.1 ACTIVITIES AND MILESTONES

The activities and milestones that comprise the briefing phase for a project containing AV systems are shown in **Table 2**. For smaller audiovisual design/build projects, the CITS–AV Project team takes on the roles of Lead Consultant and/or AV Consultant.

Table 2: Activities and Milestones in Briefing Phase

Activities and Milestones	Accountable	Notes
Conduct client briefing meeting	Architect (Lead Consultant)	CITS–AV Project team invited. Initial CAD by Architect
AV Consultant engaged	Architect	**Milestone** CITS–AV Project team to advise on recommended AV Consultant
Provide University AV standards documentation	CITS–AV Projects	
Detailed requirements-gathering meeting(s)	AV Consultant	Other CITS teams informed
Document AV functional requirements of stakeholders	AV Consultant	Proposed CAD by Architect
Develop concept design using AV standards with special case exceptions	AV Consultant	CITS–AV briefed and approve design (together with business stakeholders if not standard)
Provide preliminary cost estimates	AV Consultant	
Deliver concept design brief	AV Consultant	**Milestone** Approved by Architect. Layout design approved by University

4.2 CLIENT BRIEFING

The CITS–AV Project Facilitator must be involved during the initial briefing meeting. At this point it may be decided that an approved external AV consultant be engaged due to the complexity of the proposal, or the need for relevant experience or contract requirements.

4.3 REQUIREMENTS GATHERING

A detailed requirements gathering, or *needs assessment*, exercise is required to determine the specific requirements and expectations. The activity typically includes interviews with the sponsor, stakeholders and end users. A discovery exercise can be taken to assess additional contextual requirements e.g. sustainability. A physical survey of existing facilities and equipment may take place.

4.4 CONCEPT DESIGN BRIEF

A concept design brief document, also known as a *return brief*, describes the sponsor's requirements, the purpose and functionality of the AV system and an estimate of probable cost (with ± 10 per cent). The document can include diagrams, sketches, and photos to demonstrate the system, space and infrastructure considerations. There must be enough information in the document, in a non-technical format, to allow the sponsor to make an informed decision about the viability of the project.

5 DESIGN PHASE

5.1 ACTIVITIES AND MILESTONES

The activities and milestones that comprise the design phase for a project containing AV systems are shown in **Table 3**. For smaller audiovisual design/build projects, the CITS–AV Project team takes on the roles of AV Consultant and Builder and may award the contract using standard University procurement processes.

Table 3: Activities and Milestones in Design Phase

Activities and Milestones	Accountable	Notes
Builder appointed	Architect	
Develop detailed AV brief including: Schematic drawings Bill of materials Joinery designs Elevations, layouts and ceiling plans Heat loads, acoustic Budget	AV Consultant	Workshop with CITS–AV who approve final technical design
Coordinate provision of proposed infrastructure requirements: Architectural and Interior Design Electrical Mechanical Acoustics Information Technology	AV Consultant	Includes incorporation of AV requirements into construction documentation
Prepare AV contract and tender specification	AV Consultant	
Issue tender specification to market	Builder	**Milestone**
Evaluate tenders responses, make recommendation	AV Consultant	Include CITS–AV in the evaluation process
Award contract to AV integration company	Builder	**Milestone**
Develop initial project schedule incorporating AV requirements	Builder	

5.2 VENUE DRAWINGS

These documents form part of the detailed AV brief. One document called 'general arrangement' shows the details necessary to coordinate the layout and location of the AV system components. The details include, but are not limited to:

- heights for mounted equipment such as screens, projectors, camera and speakers
- layouts for AV equipment integrated into furniture
- mounting hardware locations
- cable pathways
- connection plate locations.

Other documents in this set should include:

- front and side elevations
- projector/FPD maximum viewing distances
- camera locations and capture area
- mounting details
- ceiling microphone/speaker placements.

5.3 AV SYSTEM DRAWINGS

These documents in the detailed AV brief describe the audio, video and control signal switching and routing, and other details necessary to convey the complete AV system design. The AV Integrator must workshop these drawings with CITS–AV Projects, which approves the final technical design:

- schematic diagrams for audio, video and control
- cabling and patching schedule
- power diagrams showing components groups onto switchable circuits for remote assistance and low power distribution
- equipment rack layouts
- specialised plate and patch panels including engraving details
- labelling requirements.

5.4 INTERFACE AND PROGRAM DESIGN

These documents and templates provide the requirements for design and configuration of the interface and control program:

- global code
- central configuration
- interface layout
- digital signal processor (DSP) templates.

5.5 ARCHITECTURAL AND INTERIOR DESIGN COORDINATION

This activity relates to the coordination required with architects and interior designers to ensure the proper integration of the AV system into the designated space. This involves the inclusion into construction documentation of AV requirements such as:

- projection sightlines and distances
- ceiling height recommendations
- lectern locations and presenter ergonomics
- lighting zones and control
- acoustic controls
- custom furniture and containment
- equipment rooms, service, cooling and serviceability
- disability access.

5.6 ELECTRICAL COORDINATION

This activity ensures proper communication and coordination with the project electrical engineers and contractors of AV requirements such as:

- Australian and university standards for high and low voltage installations
- expected AV-related electrical loads and circuit-breaker requirements
- clean power and surge suppression
- GPO locations
- isolated ground and same phase requirements
- pathways of high and low voltage cabling
- soft wiring for mobile lecterns.

A common document used for coordination is the reflected ceiling plan, which shows the ceiling layout and zones for lighting.

5.7 MECHANICAL COORDINATION

This activity outlines to mechanical services professionals the AV requirements such as:

- containment pathways for AV cabling
- vibration-free attachment points for ceiling equipment.

5.8 ACOUSTICAL COORDINATION

This activity ensures the acoustical design criteria developed by the acoustical consultant for the project is inclusive of the conditions that could directly impact the

audio experience in the designated space. The AV requirements related to acoustics may include:

- ambient noise levels
- reverberation time
- speech transmission index
- mechanical system noise reduction
- hearing augmentation.

5.9 INFORMATION TECHNOLOGY COORDINATION

This activity ensures the coordination of AV-related requirements for voice, data and computing services such as:

- procurement of network and computing equipment
- outlet quantity and locations
- network capacity and bandwidth
- prioritisation for video and audio traffic.

5.10 TENDER SPECIFICATION

For capital projects, it is the responsibility of the AV Consultant to produce the necessary written specifications of the audiovisual system and installation for the contract submission or Request for Proposal (RFP) process. As well as the general conditions, submittal formats and tender process requirements, this documentation includes:

- Curtin University AV standards
- design brief
- bill of materials of all equipment
- venue drawings
- schematic diagrams
- system performance expectations
- materials handling
- testing and commissioning templates
- submission evaluation matrix.

Although the final decision on awarding the contract is the responsibility of the Builder, CITS–AV must be provided the opportunity to review all tender or RFP submissions with the AV Consultant and have significant influence on which conforming submission is selected.

6 CONSTRUCTION PHASE

6.1 SCHEDULING

The Project Manager must ensure that the schedule of works incorporate all the necessary audiovisual installation activities during the construction phase, as shown in **Table 4**.

Table 4: Activities and Milestones in Construction Phase

Activities and Milestones	Accountable	Typical Duration	Critical Path Narrative ID
Issue notice of award to AV Integrator	Builder	**Milestone**	
AV shop drawings and approval	AV Consultant	2 weeks	1a
Procurement of AV equipment	AV Integrator	6–8 weeks	7
Procurement of CITS-supplied network and computer equipment	CITS–Networks CITS Desktop	4–6 weeks	2, 16, 17
Install 'rough in' of AV cabling	AV Integrator	1 day/ system	6
Power and data installations in communications room	Electrical Contractor	1 week	
Inspect and handover the communications room	Electrical Contractor	**Milestone**	5, 8
Install network switches	CITS–Networks	2 days	3, 9
AV equipment install in communications room	AV Integrator	2 days	
Power and data installations in class/meeting rooms	Electrical Contractor	1 day/ room	
Submit UTP test results to CITS	Electrical Contractor	**Milestone**	10, 11
Issue populated DNIS	AV Integrator	1 day	12
Complete IP allocations using DNIS	CITS–AV Projects	0.5 day	13
Complete network patching and VLAN allocations for venues	CITS–Networks	1 day	14
Complete each venue as secure and lockable	Builder	**Milestone**	22, 23

Activities and Milestones	Accountable	Typical Duration	Critical Path Narrative ID
Test and verify network	AV Integrator	1 day	15
Computers, iPads etc. imaged and delivered	CITS Desktop	1 day	11, 18, 19, 20, 21
AV equipment install in class/meeting room	AV Integrator	2 days/ system	24
AV commissioning for each system	AV Integrator	1 day/ system	25, 26, 27
Preliminary inspection of AV systems	CITS–AV Projects AV Consultant	0.5 day/ system	27
Defects rectification	AV Integrator	1 day/ system	28, 29
Complete user acceptance testing	Learning & Teaching (or user rep)	0.5 day/ system	33
Final inspection of AV systems	AV Integrator CITS–AV Projects AV Consultant	**Milestone** 0.5 day/ system	30, 31
Provide technical and user training	AV Integrator	1 day	32, 37, 38

Note: The critical path with narrative is shown in Appendix B and Appendix C.

6.2 SHOP DRAWINGS

The CITS–AV Project Facilitator must approve the shop, or final, versions of the design documentation before commencement of installation activities. If any variations occur during installation, shop drawings must be resubmitted for approval.

6.3 ROOM HANDOVERS

The Builder must receive sign-off by CITS–Networks and the AV Integrator that communications rooms are clean, air conditioned, lockable and security controlled before the commencement of AV, data and telephony installation.

With regard to class/meeting rooms that will contain AV systems, the Builder must receive sign-off from the AV Integrator that rooms are clean, lockable and security controlled before the commencement of AV equipment installation.

6.4 UTP TESTS AND VERIFICATION

The Electrical Contractor must provide CITS–Networks with the UTP test results before the commencement of any network patching and configuration activities.

The AV Integrator must verify the patching and VLAN status of all network ports used by AV systems before the commencement of equipment installation.

6.5 DEVICE AND NETWORK INFORMATION SHEET (DNIS)

The AV Integrator must complete all the relevant fields in the supplied Device and Network Information Sheet (See Part 7 – Resource 7 for template) to enable CITS–AV to generate IP allocations and complete network port patching/configuration requests.

6.6 EQUIPMENT INSTALLATION

The AV Integrator must adhere to the standards for equipment installation as detailed in AV Standards Part 2 – Technical Design Standards.

6.7 COMMISSIONING

The AV Integrator must perform a final commissioning audit of the installed AV system using the supplied iAuditor template. The report on the results of the audit must be supplied to the CITS–AV Project Facilitator. For capital projects, any issues should be raised with the PCG and entered into the Issues Register.

6.8 PRELIMINARY INSPECTION AND DEFECT RECTIFICATION

The CITS–AV team and/or AV Consultant should conduct the preliminary inspection of the class/meeting room with the AV Integrator in close attendance to quickly resolve observed defects. Other reported defects have to be rectified by the AV Integrator before the User Acceptance Test (UAT). Any issues should be raised with the PCG and entered into the Issues Register.

6.9 USER ACCEPTANCE TEST

The nominated user will perform the User Acceptance Test as described in AV Standards Part 7 – Resource 6 for AV systems based on the standard types.

6.10 FINAL INSPECTION

The AV Consultant must arrange a final inspection meeting to enable final sign-off of the room as being accepted by the University.

6.11 TECHNICAL AND USER TRAINING

The AV Integrator must provide technical training suitable for the support and maintenance to the CITS–AV team. The AV Integrator must provide basic user training to relevant University staff.

7 COMMISSIONING AND HANDOVER

7.1 ACTIVITIES AND MILESTONES

The activities and milestones that comprise the commissioning phase for a project containing AV systems are shown in **Table 5**. For smaller audiovisual design/build projects, the CITS–AV Project team takes on the role of AV Consultant.

Table 5: Activities and Milestones in Commissioning and Handover Phase

Activities and Milestones	Accountable	Notes
Provide operations manuals, code and as-built drawings	AV Integrator	
Provide support during defects liability period (DLP)	AV Integrator	
Review and report on suitability of AV systems (six months after practical completion)	AV Consultant	

7.2 HANDOVER DOCUMENTATION

The documentation to be handed over to the University includes:

- the final as-built versions of the design documentation, in PDF or other unalterable format, including any new details introduced during construction
- operations and maintenance manuals in MS Word format
- user guides
- the most recent versions of control and touch panel codes, including any new drivers or configurations where the global code has been used
- Device and Network Information Sheet (DNIS)
- DSP configurations files
- warranty certificates
- cable test results
- commissioning audit reports.

Hard copies of the DNIS and schematics are to be laminated (A3) and left onsite in the rack drawer.

The following hardware items are to be handed over to the CITS–AV Projects Facilitator:

- all remote controls including batteries
- spare cables and brackets supplied with purchased equipment.

7.3 DEFECTS LIABILITY PERIOD

The AV Integrator is to provide 12 months of defects liability on AV systems related to the project. This period commences from the date of Practical Completion. The defects liability includes the replacement or repair of any equipment, cabling, terminations or systems that fail to operate in accordance with the manufacturer's specifications or within the specifications of the integrated system.

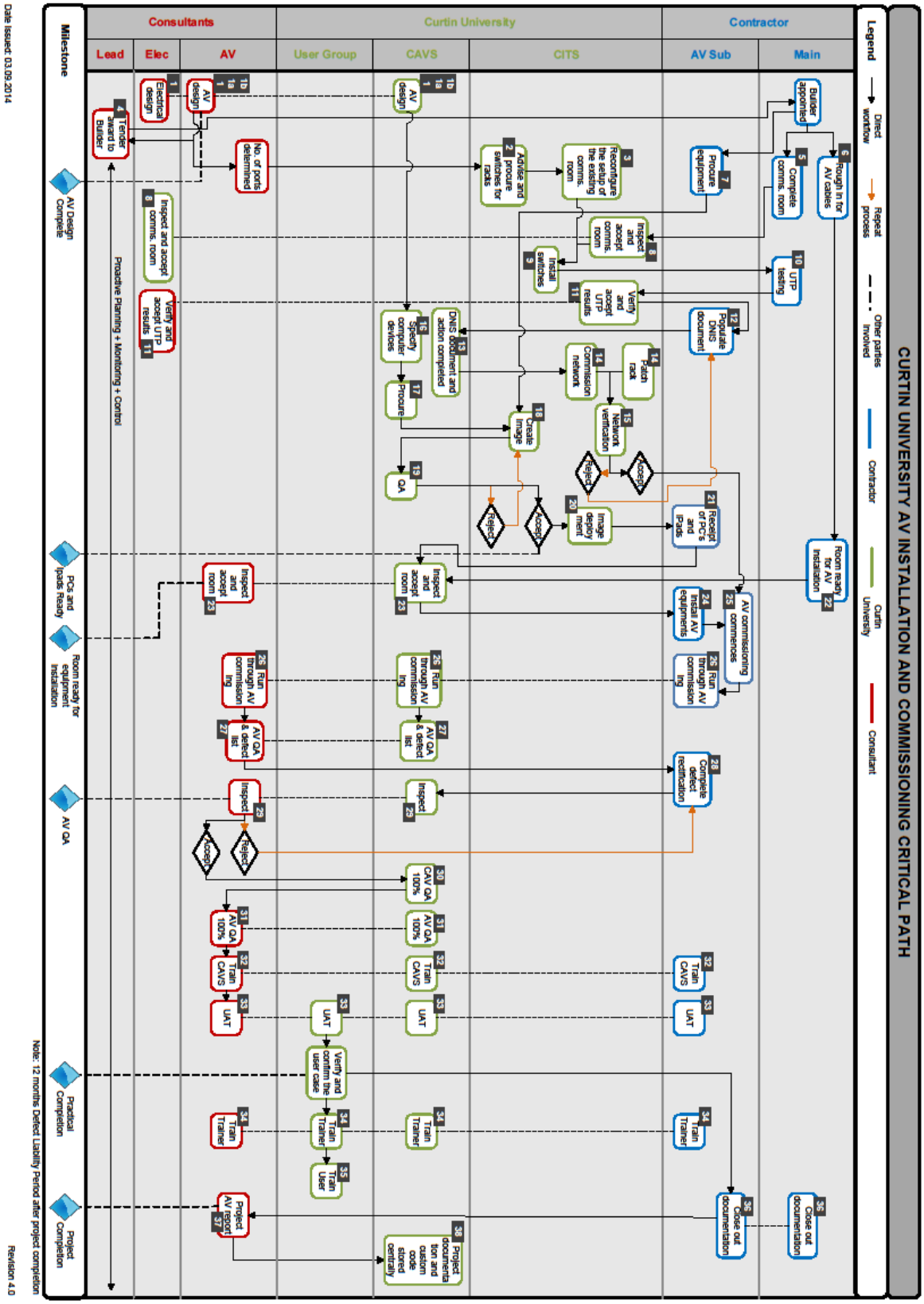
7.4 REVIEW

The AV Consultant is to conduct a review six months after final inspection, and report on the suitability of the installed AV systems compared to the original requirements documentation.

8 APPENDIX A: GLOSSARY OF TERMS

Term or Acronym	Definition
AV	Audiovisual
AVIP	Audiovisual Interface Point (aka lectern)
Audiovisual (AV) System	All equipment integrated into the infrastructure necessary to fulfil the intent of communicating audio and/or video content to an audience. It is a set of specified, individual audio and video components designed and configured to operate as one comprehensive system
Audio	Any audio signal in either analog or digital format
BOM	Bill of Materials
BYOD	Bring Your Own Device, e.g. laptop, tablet, smart phone.
CAVS	Alternate abbreviation for CITS Audiovisual (project and support team)
CITS	Curtin Information Technology Services
CITS–AV	CITS Audiovisual (project and support team)
CTS	Certified Technical Specialist. The first level certification provided by Infocomm in AV specialisation
Information and Communications Technology (ICT)	Any communication device, application, or service related to radio, television, mobile, telephony, computing, networking and satellite systems
IP	Internet Protocol
MOE	Managed Operating Environment
NCC	National Construction Code
Practical Completion	The point at which a newly constructed building is handed over to the University
PF & D	Properties, Facilities and Development

9 APPENDIX B: AV INSTALLATION AND COMMISSIONING CRITICAL PATH



10 APPENDIX C: INSTALLATION AND COMMISSIONING NARRATIVE

NO	TASK	OWNER/S	DELIVERABLES	PRED
1	Electrical and AV Design	AV Consultant Electrical Consultant CAVS	No. of ports determined Project Specific Training Bill of Materials RFP Documentation Requirements for joinery, lighting, mechanical, data and containment	0 - Start
1a	Technical review of RFP documentation and relevant pre-construction drawings	AV Consultant CAVS	Approval of RFP documentation and relevant pre-construction drawings	1
1b	Technical review of RFP submissions	AV Consultant CAVS	Approval of AV integrator selection	1a
2	Advise and procure switches for racks	CITS/ CITS Network	Switches procured	1
3	Re-configure the setup of the existing comms room.	CITS/ CITS Network	-	2
4	Tender Award to Builder	Lead Consultant	Builder appointed	1b
5	Complete comms. Room - all trades complete & out - dust free environment - restricted access regard handover	Main Contractor	Building - Ceilings - Walls - Painting - Flooring - Frame racks in Services - A/C - Security - Light - Power - Fire (Project specific)	4
6	Rough in for AV Cable	Main Contractor	Rough in for AV Cable completed.	4
7	Procure equipment	AV Sub-Contractor	Equipment procured	4
8	Inspect and accept comms. room	Lead Consultant Electrical Consultant	-	5

NO	TASK	OWNER/S	DELIVERABLES	PRED
		CITS Network		
9	Install switches	CITS Network	Switches installed.	3, 8
10	UTP testing	Main Contractor	Test results (UTP result numbers in Curtin University 's format)	9
11	Verify UTP results	CITS Network Electrical Consultant	UTP results verified and accepted	10
12	Populate DNIS document	AV Sub-Contractor	DNIS document include IP addresses	11
13	DNIS document and actions completed	CAVS	Assign IP addresses	12
14	Patch rack and commission network	CITS Network	Network patched and VLANs active	13
15	Verify network with physical test at each port	CITS Network	DNIS updated with port status to 100% complete	14
16	Specify computer devices	CAVS	-	1
17	Procure computer devices	CAVS	Computer devices procured	16
18	Create Image	CITS MOE	-	7, 17
19	QA	CAVS	-	18
20	Image deployment	CITS Deployment	Venue-ready PCs and iPads	19
21	Receipt of PC's and iPads	AV Sub-Contractor	-	20
22	Room ready for AV installation - all trades complete & out - dust free environment - restricted access regard handover	Main Contractor	Building - Ceilings - Walls - Painting - Flooring - Frame racks in Services - A/C - Security - Light - Power - Fire (Project specific)	6

NO	TASK	OWNER/S	DELIVERABLES	PRED
23	Inspect and accept room	AV Consultant CAVS	Milestone	22
24	Install AV equipment	AV Sub-Contractor	AV equipment installed	23
25	AV commissioning commences	AV Sub-Contractor	AV Comms. Document 95%	15, 24
26	Run through AV commissioning	AV Sub-Contractor CAVS AV Consultant	-	25
27	AV QA	CAVS AV Consultant	Defect List	26
28	AV Defect Rectification	AV Sub-Contractor	AV Comms. Document 100%	27
29	Re-inspect defects	CAVS AV Consultant	-	28
30	CAV QA 100%	CAVS	-	29
31	AV QA 100%	CAVS AV Consultant	Commissioning Checklist	30
32	Train CAVS	AV Sub-Contractor AV Consultant CAVS	-	31
33	User acceptance testing (UAT)	AV Sub-Contractor AV Consultant User Group CAVS	Verify and confirm user case	32
34	Train Trainer	AV Sub-Contractor AV Consultant User Group CAVS	-	33
35	Train User	Curtin University	Implement project specific training plan	34
36	Close out documentation	AV Sub-Contractor Main Contractor	As-cons, manuals and final DNIS	33

NO	TASK	OWNER/S	DELIVERABLES	PRED
37	Project AV report	AV Consultant	AV project completion	26
38	Project documentation and custom code stored centrally	CAVS	User guides - paper and online	37

11 APPENDIX D: AV PROJECT RACI MATRIX

Role / Project Deliverable (or Activity)	Project Leadership			Project Team					Contributors			
	External PM	Architect	PF&D Portfolio Manager	Builder	Electrical Contractor	AV Consultant	AV Integrator	CITS Coordination	CITS-AV Project	Learning and Teaching	CITS Networks	CITS Desktop
Briefing Phase												
Conduct client briefing meetings	R	A	C		C	A			C	C	I	I
Document AV functional requirements of stakeholders		R	I			A		I	I			
Provide AV standards documentation						I		R	A			
Develop concept design using AV standards with special case exceptions		R				A			C	C		C
Provide preliminary cost estimates	I	R	I			A						
Deliver concept design brief	I	R				A		I	I	I	I	I

	Project Leadership				Project Team				Contributors			
	External PM	Architect	PF&D Portfolio Manager	Builder	Electrical Contractor	AV Consultant	AV Integrator	CITS Coordination	CITS-AV Project	Learning and Teaching	CITS Networks	CITS Desktop
Design Phase												
Develop detailed AV brief according to Australian standards, BCA, AV standards, university guidelines, etc.		R				A			C			
Coordinate provision of proposed infrastructure requirements to other services (electrical, mechanical, networks, interiors)	I	R		C	I	A			I		I	I
Prepare AV contract and tender specification		R				A			C			
Issue tender/RFP to market	I	I	I	R A		I			I			
Evaluate tenders responses, make recommendation	I	I	I	R		A			C			
Award AV contract to integration company			C	R A								
Develop initial project schedule incorporating AV requirements	C	I	I	R	C	C	C	I	C		C	C

	Project Leadership				Project Team				Contributors			
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				A								
Construction Phase												
Develop final project schedule	C	I	I	R A	C	C	C	I	C		C	C
Submit AV shop drawings and product samples						R	A		C			
Submit AV test and commissioning plan						R	A		C			
Procurement of AV equipment			I			I	R A					
Procurement of CITS supplied network and desktop equipment						I	I	R			A	A
Complete 'rough in' for AV cabling				R		I	A					
Complete power and data installations in communications room	I			R	A	I						

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including labelling												
Submit comms room UTP test results				R	A			I			I	
Complete comms room as secure and lockable	C			R A		I	I	I			I	
Network equipment (re)configuration and switches installation	I			R			I	I			A	
Complete power and data installations in venues including labelling	I			R	A	I		I			I	
Submit venue UTP test results				R	A			I			I	
Issue populated DNIS						R	A	C	I		I	
Complete IP allocations using DNIS							I	R	A			
Complete network patching and VLAN allocations for venues						I	I	R			A	

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Complete each venue as secure and lockable	C			R A		I	I	I				
Verification of network patching and VLAN allocations						R	A	I			C	
Desktop equipment imaged and delivered							C	R	I			A
AV equipment installation				R			A		I			
Complete test and commission for each venue				I		R	A		I			
AV quality audit						R	C		A			
Defects rectification	I			I		R	A		C			
Final inspection of AV systems	C			I		R	A		A			
Complete user acceptance testing						R			I	A		

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Provide technical and user training						R	A		C			
Commissioning and Handover												
Provide operation manuals, code and as-built drawings						R	A		I			
Provide support during defects liability period (DLP)				R			A		C			
Review and report on suitability of AV systems (4 weeks after PC)		I		I		R		A	C	C		
Project Control and Admin												
Project control group (PCG) meetings	R	A	C			C		I	C	C		
Site coordination meetings				R		A		I				
Issue recommendation on AV practical completion (PC)	R	I	I	C		A		I	I		I	I

	Project Leadership				Project Team				Contributors			
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Note: RACI represents: R - Responsibility, A - Accountable, C - Consulted, and I – Informed where:

Responsibility = person or role who ensures that the item is completed

Accountable = person or role who does the work to complete the item

Consulted = person or role whose subject matter expertise is required in order to complete the item

Informed = person or role that needs to be kept informed of the status of item completion.