



Queensland University of Technology

Audiovisual Facility Design Standards 2016



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Audiovisual Facility Design Standards

Section 1. Introduction

The purpose of this publication is to ensure that all audiovisual facilities are designed and constructed to the same standard as set out by QUT Learning Environments.

Where possible, these guidelines will be used as the standard to which the facilities will be designed. Where for some reason, these standards cannot be met, consultation during the design stage, prior to the commencement of any construction works, with Learning Environments staff, must be undertaken.

This publication details the physical requirements for the audiovisual equipment to be used in flat floored classrooms, meeting rooms, computer labs and tiered lecture theatres. See appendix 1 for room classifications.

Section 2. Physical Requirements for PBL4 Flat Floored Classrooms, Meeting Rooms and Computer Labs

2.1 Equipment racks

Audiovisual equipment is typically mounted in standard 19” racks. Racks must provide convenient access to the front and rear of equipment.

Where racks must be installed in joinery, rear access, in the form of a lockable door is to be provided, the lock shall be to the QUT standard AV key, provided by Learning Environments staff. Where rear access cannot be provided, the joinery must allow the rack to be easily slid out for servicing. There must be no plinth or separate cupboard floor, and there must be sufficient width and depth (clear of obstructions such as hinges) for the rack and a bulky loop of cables.

The minimum internal dimensions are to be: 800mm(H) x 750mm(W) x 800mm(D)

For PBL4 spaces, the AV equipment rack is to be mounted in a teaching station (lectern).

All power and network outlets required for connection to the AV equipment must be provided inside the cupboard space.

An accessible cable path – comprising of a minimum of 1 x 50mm, (or 2 x 32mm) PVC conduit(to carry multiple AV signal cables in a vermin proof enclosure), from the AV equipment rack position up to the ceiling, is to be built into the wall cavity, terminating in the ceiling space, and must be provided by the building contractor. Where there are bends in the conduit, an elbow with a removable inspection cover must be used, this is to allow access to the cable/s being drawn through to ensure no crushing occurs. A draw wire must be fitted in the conduit at the time of installation.

Where the cables must be run on the surface of an existing wall, 1 x 50mm x 25mm duct with removable lid is to be supplied to carry these signal cables.

Where cables are to be run in the ceiling void, a separate cable catenary must be supplied and run by the shortest possible path

2.2 Ventilation

Regardless of location, there must be sufficient ventilation (air flow) to prevent unacceptable temperature rise.

Recommended ventilation is an air inlet grill in the bottom of the front door and an outlet grill in the cupboard top, mounted to the rear of the compartment. For design purposes, assume a heat load of 1000 watts (minimum) and a temperature rise of 10 degrees Celsius above ambient (maximum).

Refer to fig. 2 for ventilation requirements.

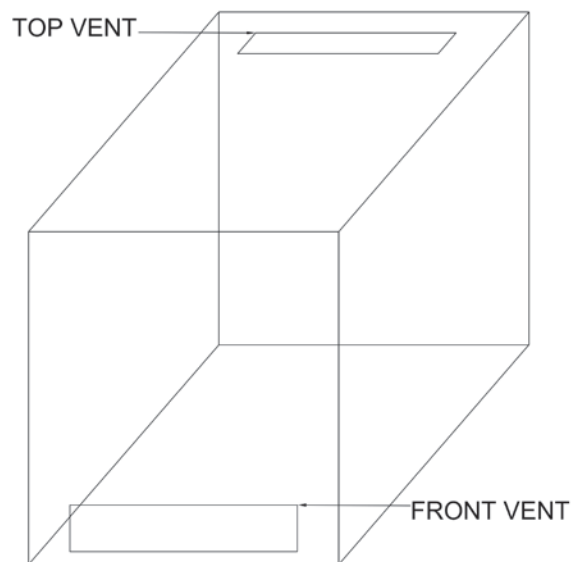


Fig.2 Ventilation layout

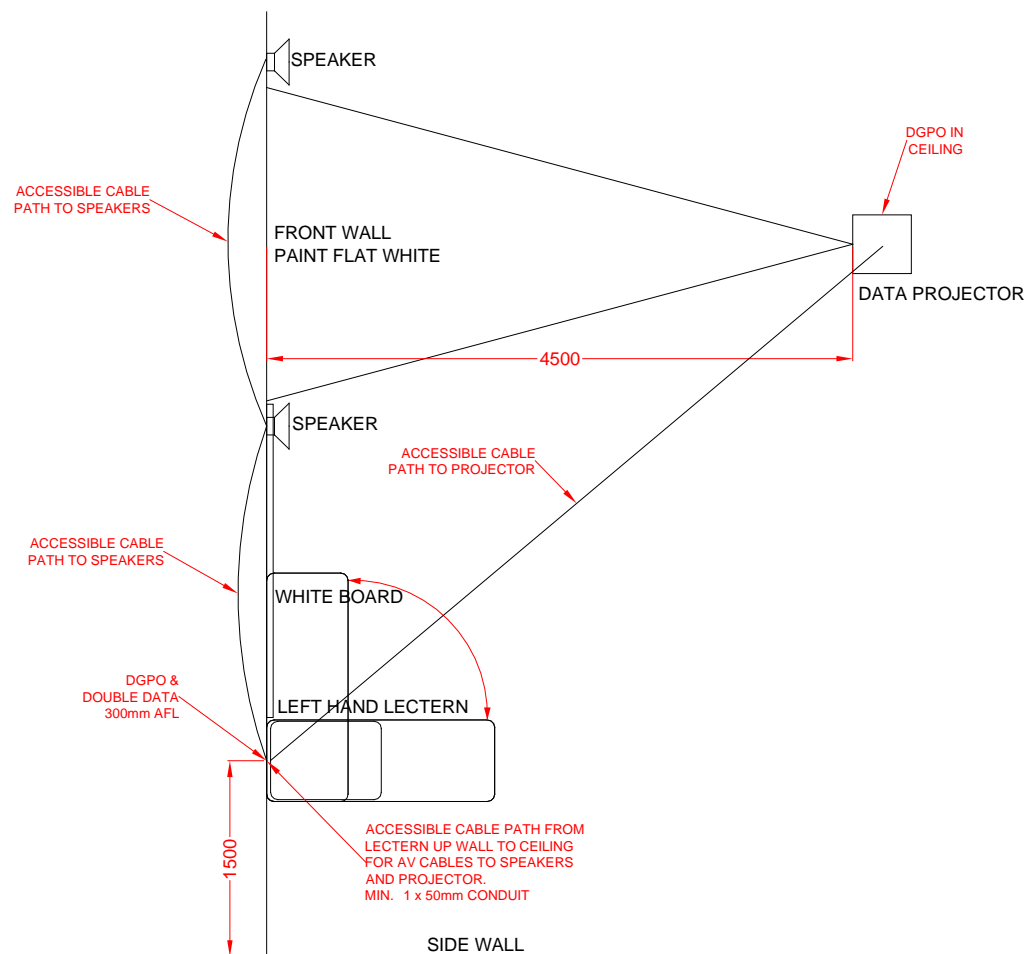
Suggested minimum vent panel dimensions are: 300mm x 50mm

2.3 Location

2.3.1 PBL4 Flat Floored Classroom or Computer Lab

Where possible, the teaching station (lectern) should be to the front of the room, against the side wall, furthest from the entry door, positioned 1200mm away from the front wall, to comply with AS1428 part 2 for access. Refer to fig. 3a & 3b for basic room layouts.

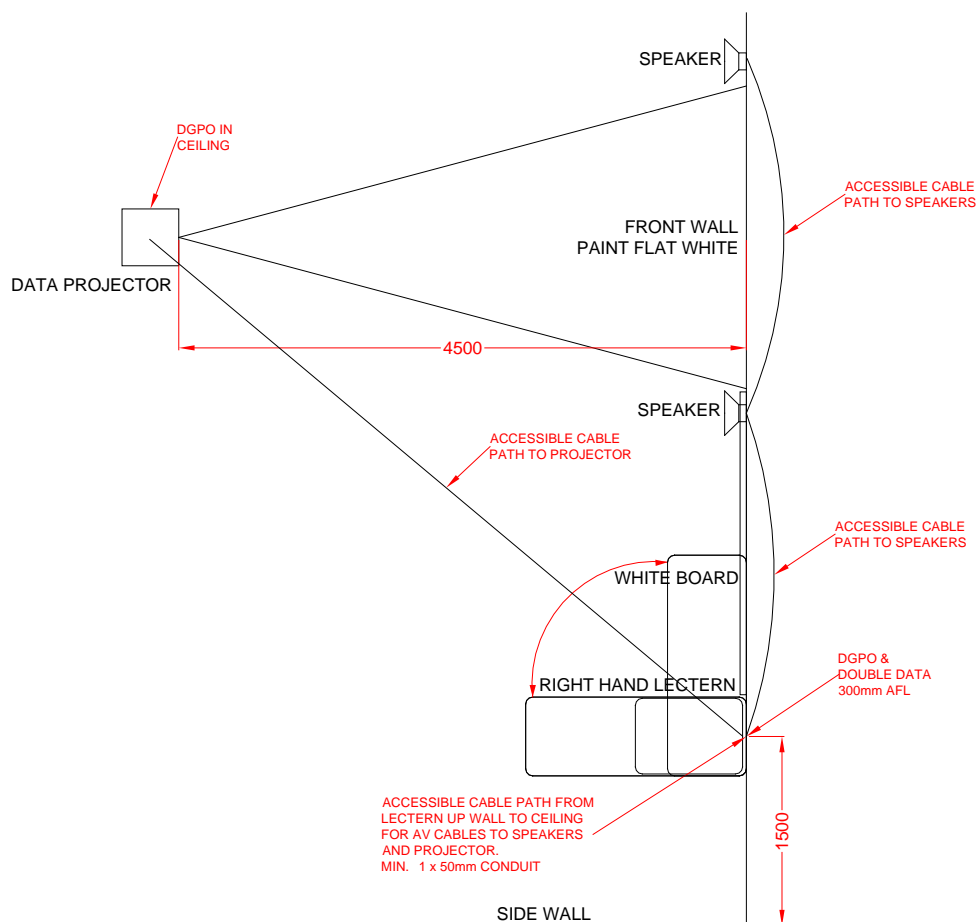
See appendix 2 for further examples of suitable floorplans



PLEASE NOTE -

THIS IS LAYOUT IS INDICATIVE ONLY, PLEASE CONFIRM ALL LOCATIONS AND DIMENSIONS WITH LETS AV PROJECTS PRIOR TO INSTALLATION.

Fig.3a basic room layout for Left hand Lectern



PLEASE NOTE -

THIS IS LAYOUT IS INDICATIVE ONLY, PLEASE CONFIRM ALL LOCATIONS AND DIMENSIONS WITH LETS AV PROJECTS PRIOR TO INSTALLATION.

Fig.3b basic room layout for Right hand Lectern

The teaching station should contain the AV equipment rack as part of its structure. QUT has a standard teaching station design that should be used where possible.

All power and network outlets and signal cables required for connection to the AV equipment must be run out of the wall, with the outlets positioned 300mm AFFL (Above Finished Floor Level), with an accessible cable path up to the ceiling from this space. Refer to Section 2.1 for details.

Provision must also be made in the ceiling, at the location of the data projector, for power and network connections for the data projector, the final position of which will be determined in consultation with QUT Learning Environments staff during the design process.

The teaching station drawings are available by contacting QUT Learning Environments.

Refer to fig. 4 for details.



Fig. 4 Standard QUT PBL4 Classroom lectern

2.3.1.1 Projection Surfaces

Where possible, the front wall of the room shall be constructed to be optically flat and painted matt or low sheen white, to facilitate projection directly onto the wall surface.

Sufficient unobstructed space – an area of approximately 3000mm wide x 2000mm high shall be provided as close as possible to the centre line of the room. This surface needs to be physically flat and unobstructed, ie. no power or network outlets, light switches etc, in this area.

Where a projection screen is to be fitted, QUT Learning Environments recommends that the bottom of the screen surface, ie. the bottom of the image, is positioned a minimum of 1200mm AFFL. Any variations to this need to be approved by QUT Learning Environments.

2.3.2 Meeting Room

Where possible the AV equipment should be mounted in a joinery unit at the front of the room, paying attention to 2.1 Equipment racks & 2.2 Ventilation.

The height of the joinery unit should be no more than 900mm AFFL, to allow sufficient height for the projected image.

Refer to fig. 5 for basic room layout and fig. 6 for cupboard layout example.

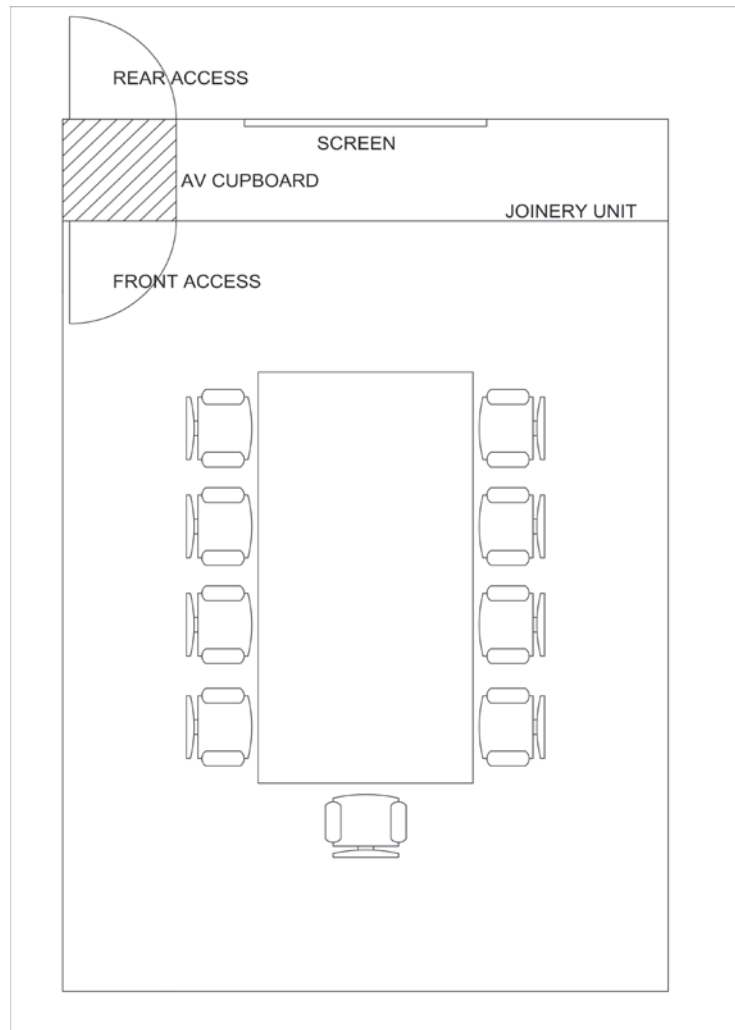


Fig. 5 basic meeting room layout



Fig. 6 Cupboard layout example

Provision must also be made in the ceiling, at the location of the data projector, for power and network connections for the data projector, the final position of which will be determined in consultation with QUT Learning Environments staff during the design process.

Provision must also be made in the ceiling structure for the inclusion of flush mounted speakers, typically 2 to 4 in number, again the final size and position of which will be determined in consultation with QUT Learning Environments staff during the design process.

2.3.2.1 Projection Surfaces

Where possible, the front wall of the room shall be constructed to be optically flat and painted matt or low sheen white, to facilitate projection directly onto the wall surface.

Sufficient unobstructed space – a minimum area of 2200mm wide x 1200mm high shall be provided as close as possible to the centre line of the room. This surface needs to be physically flat and unobstructed, ie. no power or network outlets, light switches etc, in this area.

Where a projection screen is to be fitted, QUT Learning Environments recommends that the bottom of the screen surface, ie. the bottom of the image, is positioned a minimum of 1200mm AFFL. Any variations to this need to be approved by QUT Learning Environments.

2.3.2.2 Large Screen Flat Panels

A common alternative to projection in these spaces is 1 or 2 large screen flat panels, either wall mounted or stand mounted on the joinery unit.

Where the flat panels are to be wall mounted, the wall must be suitably reinforced to take the weight. Refer to section 2.3.3.1 Location and Mounting.

Likewise, when stand mounting the panels, the joinery unit must be strong enough to take the units weight.

The panels must also be mechanically anchored to the joinery unit, in order to prevent them from falling over.

See appendix 3 for further examples of suitable floorplans

2.3.3 Digital Signs and other Flat Panel Displays

2.3.3.1 Location and mounting

Because of the varying nature of digital signs, their positioning will vary from one installation to another.

When specifying the location for digital signs, QUT Learning Environments follows the Building Code of Australia, which recommends that the sign is not to protrude further than 100mm from any wall it is attached to, if the sign display is to be mounted at any height from floor height up to 2100mm above the floor.

These same guidelines will apply equally to any flat panel display installed in classroom or meeting room situations.

When mounting flat panel displays to any surface, that surface must be capable of supporting a load of between 30 & 60kg for panels up to 50" and 100kg for panels over 50". Likewise, the mechanical anchors used must be sufficient in quantity and strength to support this weight, and must be installed to the manufacturers specifications.

Where an internal plasterboard wall will be the mounting surface, it must be internally reinforced with a sheet of 12mm thick plywood, fitted between the wall studs and attached by construction adhesive to the rear surface of the plasterboard. For digital signs, this sheet shall extend from the floor level up to 2400mm AFL, or the room ceiling.

In the case of a WallCow, this panel shall extend from the floor level up to 2400mm AFL, or the room ceiling if possible. And there is to be no writing surface behind the WallCow joinery unit or LCD panel.

Where the wall can't be reinforced internally, a sheet of 12mm plywood large enough to be attached across a suitable number of wall studs by appropriate screw fixings and large enough to allow the mounting bracket to fit securely, must be anchored to the wall surface and be painted in a colour to match that of the wall surface. These screw fixings must be installed to the manufacturers specifications.



Fig. 7 typical digital sign

2.3.3.2 Physical requirements of flat panel displays

Where the flat panel is to be recessed into a joinery unit or wall, a minimum gap of 50mm must be maintained between the panel and the joinery unit for ventilation.

2.3.3.3 Location and mounting of network and power services

2.3.3.3.1 Digital signs

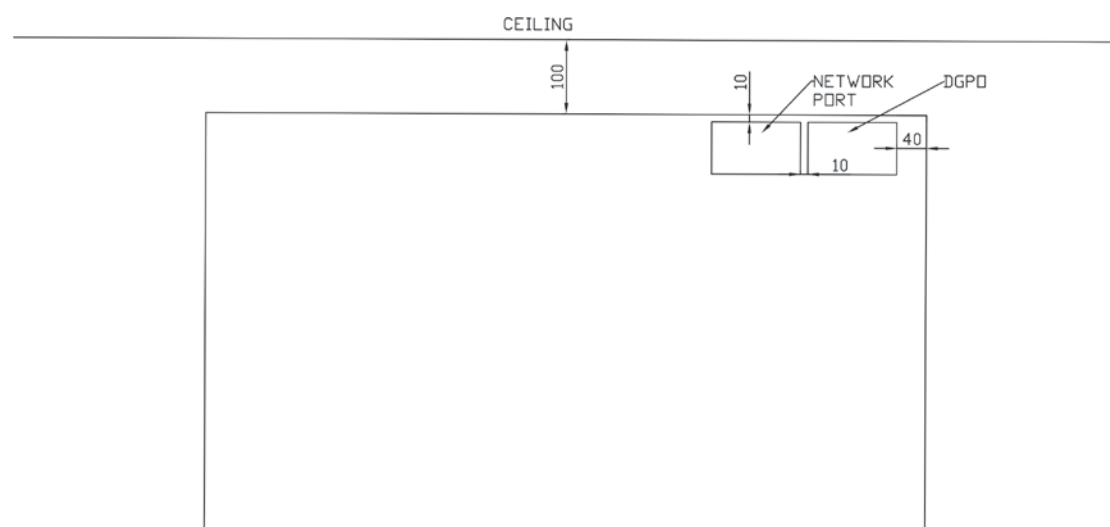


Fig. 8 Power and network layout

2.3.3.3.2 WallCoWs

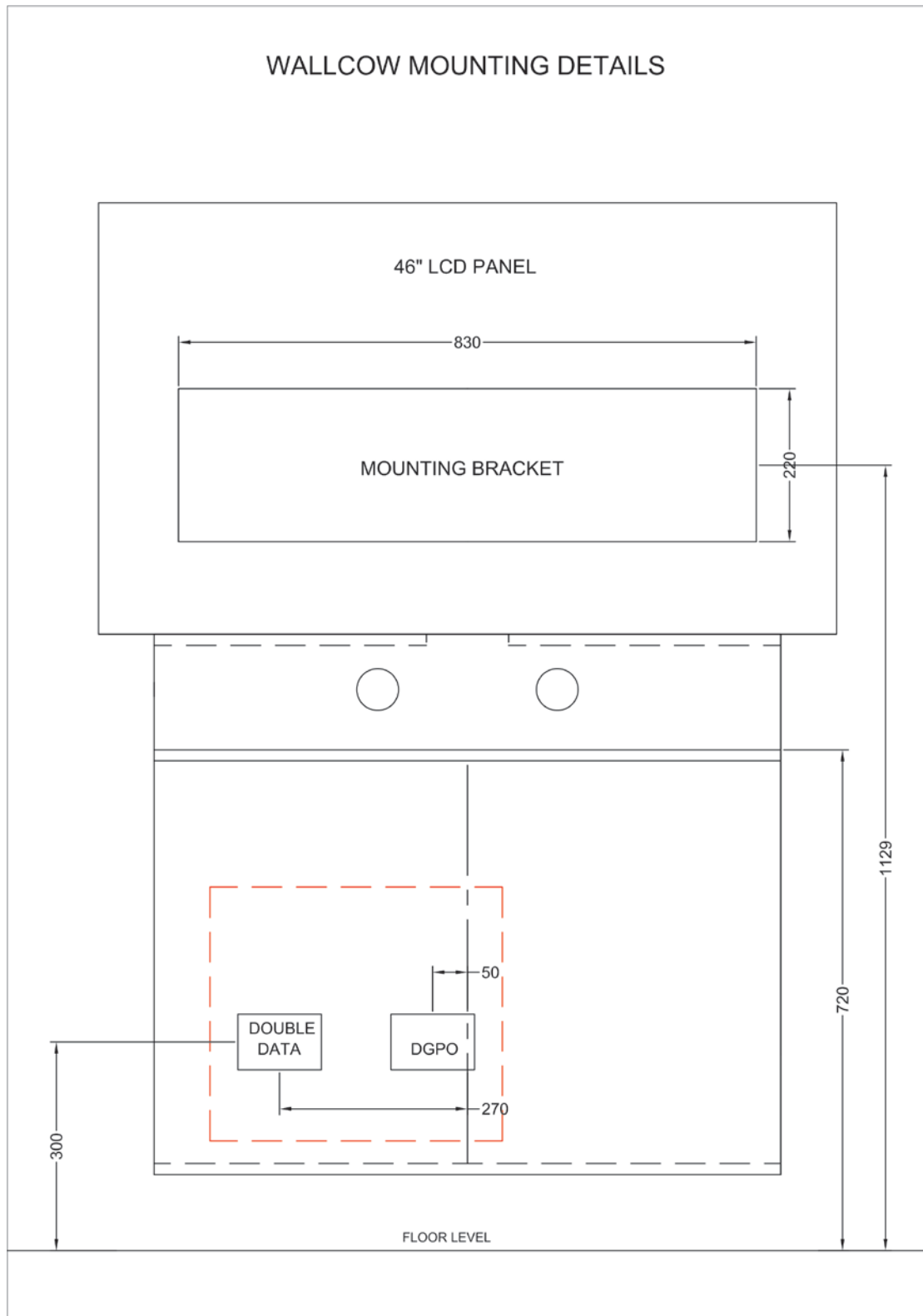


Fig. 8a WallCow mounting layout

Section 3.

Physical Requirements for PBL5 Lecture Theatres

3.1 Equipment racks

The audiovisual equipment is to be mounted in custom 19” racks, within the lectern assembly. The lectern unit is a standard QUT item, fitted to all lecture theatres across the university. The lectern drawings are available by contacting QUT Learning Environments.

Under no circumstances, is audiovisual equipment to be installed in joinery units, within the room.

All power and network outlets and signal cables required for connection to the AV equipment must be provided to the lectern space, generally via a floor trap.

An accessible cable path – comprising of a minimum of 1 x 50mm, (or 2 x 32mm) PVC conduit(to carry multiple AV signal cables in a vermin proof enclosure), from the AV equipment rack position up to the ceiling, is to be built into the wall cavity, terminating in the ceiling space, and must be provided by the building contractor. Where there are bends in the conduit, an elbow with a removable inspection cover must be used, this is to allow access to the cable/s being drawn through to ensure no crushing occurs. A draw wire must be fitted in the conduit at the time of installation.

Where the cables must be run on the surface of an existing wall, 1 x 50mm x 25mm duct with removable lid is to be supplied to carry these signal cables.

Where cables are to be run in the ceiling void, a separate cable catenary must be supplied and run by the shortest possible path

Similar, separate cable paths to the lectern must be provided for both power and network services.

Refer to fig. 9 for a typical PBL5 lectern.

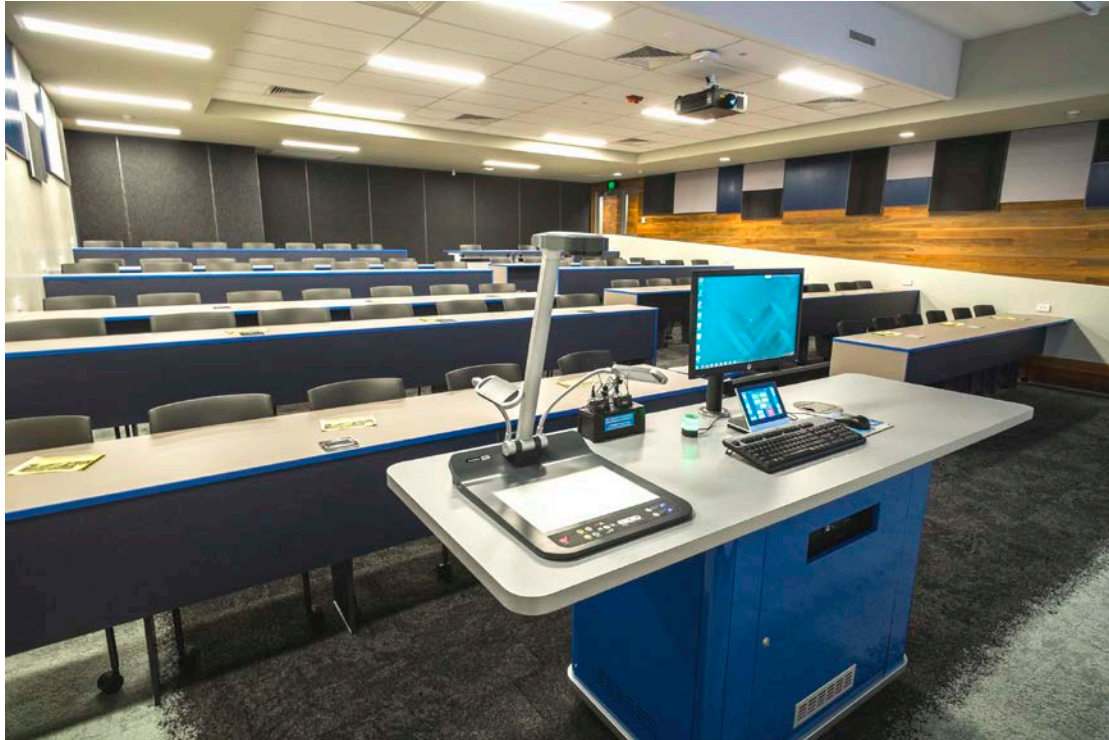


Fig. 9 a typical PBL5 lectern.

3.2 Room Layout

The lectern is to be positioned at or near to the centre of the room, allowing a gap of 1200mm to 1500mm between the front wall and the lectern, to comply with AS1428 part 2 for access.

Provision must be made at the lectern location for 1 x DGPO & 2 x data, plus an accessible cable path to the body of the room, as per section 3.1

Provision must also be made in the ceiling, at the location of the data projector, for power and network connections for the data projector, the final position of which will be determined in consultation with QUT Learning Environments staff during the design process.

Provision must be made for wall mounted speakers for program and voice reinforcement sound, the position and quantity of these will be determined in consultation with QUT Learning Environments staff during the design process.

Refer to fig. 10 for a typical PBL5 lecture theatre layout.

See appendix 4 for further examples of suitable floorplans

3.2.1 Projection Surfaces

Where possible, the front wall of the room shall be constructed to be optically flat and painted matt or low sheen white, to facilitate projection directly onto the wall surface. In a tiered theatre, the projection surface can be set above the whiteboard/s.

Sufficient unobstructed space – an area of at least 4000mm wide x 2500mm high shall be provided as close as possible to the centre line of the room. The final dimensions of this area will be determined by QUT learning environments staff during the design consultation process.

This surface needs to be physically flat and unobstructed, ie. no power or network outlets, light switches etc, in this area.

Where a projection screen is to be fitted, QUT Learning Environments recommends that the bottom of the screen surface, ie. the bottom of the image, is positioned a minimum of 1200mm AFFL. Any variations to this need to be approved by QUT Learning Environments.

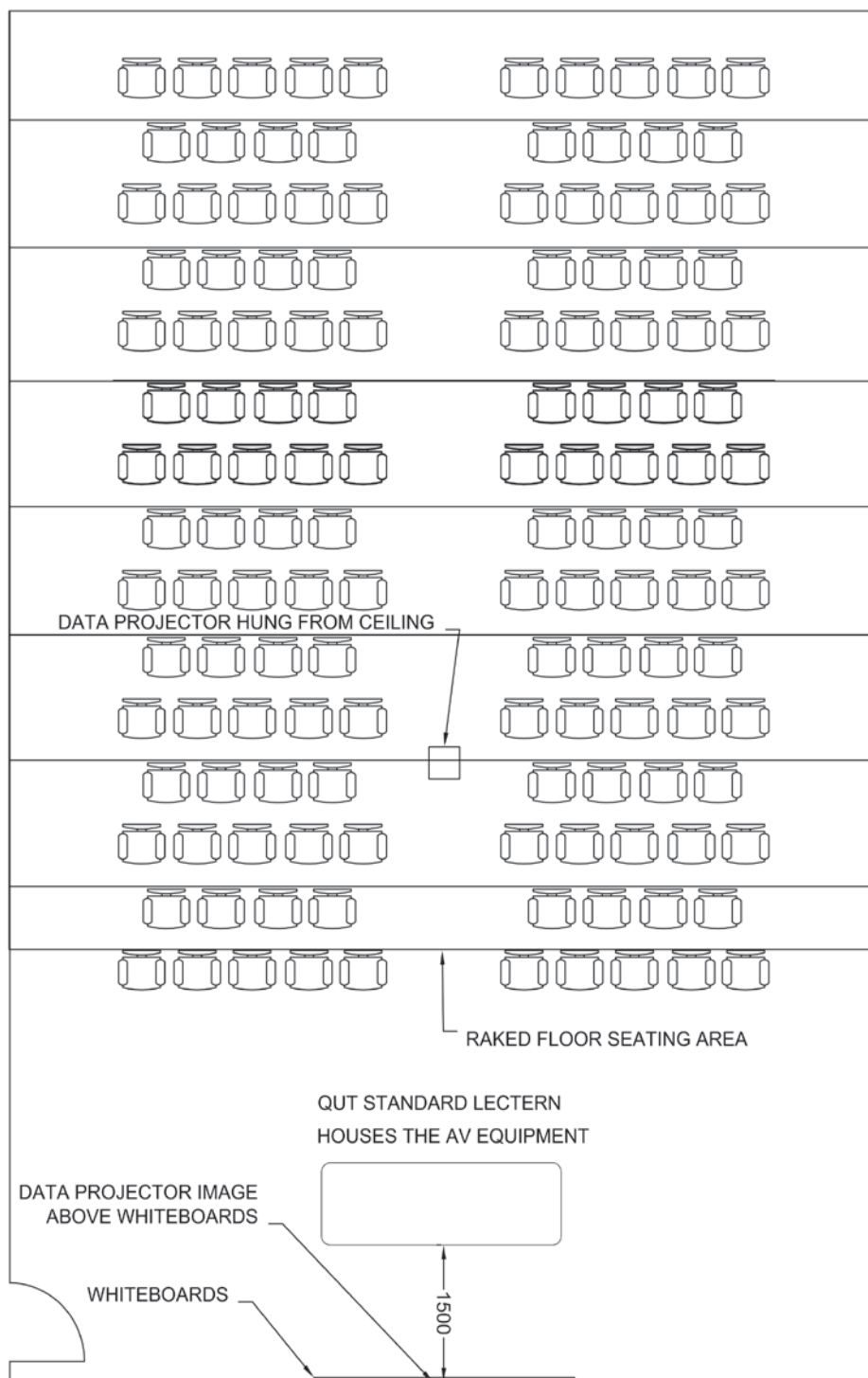


Fig. 10 a typical PBL5 lecture theatre layout.

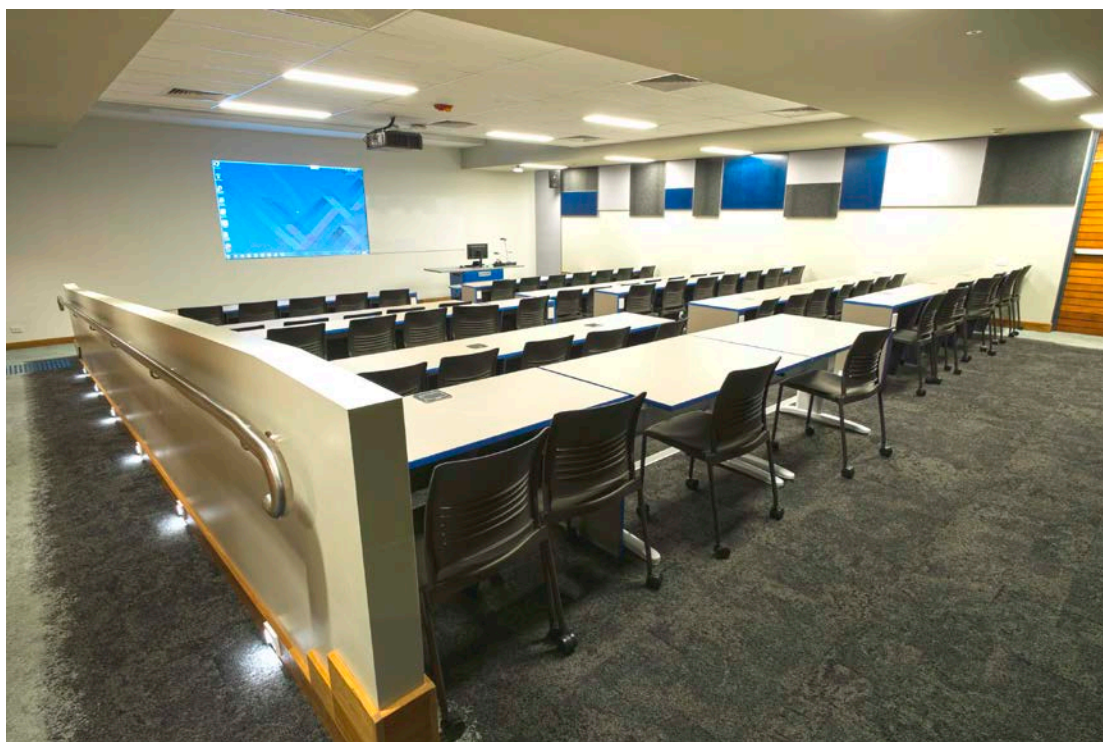


Fig.11 a typical PBL5 lecture theatre

Section 4.

Physical Requirements for AV6 & AV7 Lecture Theatres

4.1 Equipment racks

The audiovisual equipment for the presenter is to be mounted in custom 19" racks, within the lectern assembly. The lectern unit is a standard QUT item, fitted to all lecture theatres across the university. The lectern drawings are available by contacting QUT Learning Environments.

Space in the form of a biobox or projection room is to be provided at the rear of the room, on the rooms' longitudinal centre line. The technical equipment for signal processing and display shall be housed in racks in this space.

Under no circumstances, is audiovisual equipment to be installed in joinery units, within the room.

All power and network outlets and signal cables required for connection to the AV equipment must be provided to the lectern space, generally via a floor trap.

An accessible cable path – comprising of a minimum of 1 x 50mm, (or 2 x 32mm) PVC conduit(to carry multiple AV signal cables in a vermin proof enclosure), from the AV equipment rack position up to the ceiling, is to be built into the wall cavity, terminating in the ceiling space, and must be provided by the building contractor. Where there are bends in the conduit, an elbow with a removable inspection cover must be used, this is to allow access to the cable/s being drawn through to ensure no crushing occurs. A draw wire must be fitted in the conduit at the time of installation.

Where the cables must be run on the surface of an existing wall, 1 x 50mm x 25mm duct with removable lid is to be supplied to carry these signal cables.

Where cables are to be run in the ceiling void, a separate cable catenary must be supplied and run by the shortest possible path

Similar, separate cable paths to the lectern must be provided for both power and network services.

Refer to fig. 12 for a typical AV6 & AV7 lectern.



Fig.12 a typical AV6 & AV7 lectern.

4.2 Room Layout

The lectern is to be positioned at or near to the longitudinal centre line of the room, allowing a gap of 1200mm to 1500mm between the front wall and the lectern, to comply with AS1428 part 2 for access.

A biobox or projection room is to be provided at the rear of the lecture theatre, positioned on the rooms' longitudinal centre line, to provide space for technical and projection equipment, preferably with access both externally and from within the lecture theatre.

Sufficient space for the equipment racks, power outlets, network outlets and ventilation shall be provided in here, the final requirements of which will be determined by QUT Learning Environments staff during the design consultation process.

An accessible cable path – comprising of a minimum of 2 x 50mm, (or 4 x 32mm) PVC conduits (to carry multiple AV signal cables in a vermin proof enclosure), from the AV equipment rack position up to the ceiling, is to be built into the wall cavity, terminating in the ceiling space, and must be provided by the building contractor.

Similar, separate cable paths to the lectern must be provided for both power and network services.

Refer to fig.13 for a typical AV6 & AV7 lecture theatre layout.

See appendix 5 for further examples of suitable floorplans

4.2.1 Projection Surfaces

The data projector images/screens are to be located as close as possible to either side of the room centre line and positioned above the whiteboard assembly, to allow uninterrupted viewing from anywhere in the room.

The exact position and type of screen/s in these installations needs to be specified in conjunction with QUT Learning Environments.

Where possible, the front wall of the room shall be constructed to be optically flat and painted matt or low sheen white, to facilitate projection directly onto the wall surface and unobstructed, ie. no power or network outlets, light switches etc, in this area.

The final dimensions of this area will be determined by QUT learning environments staff during the design consultation process.

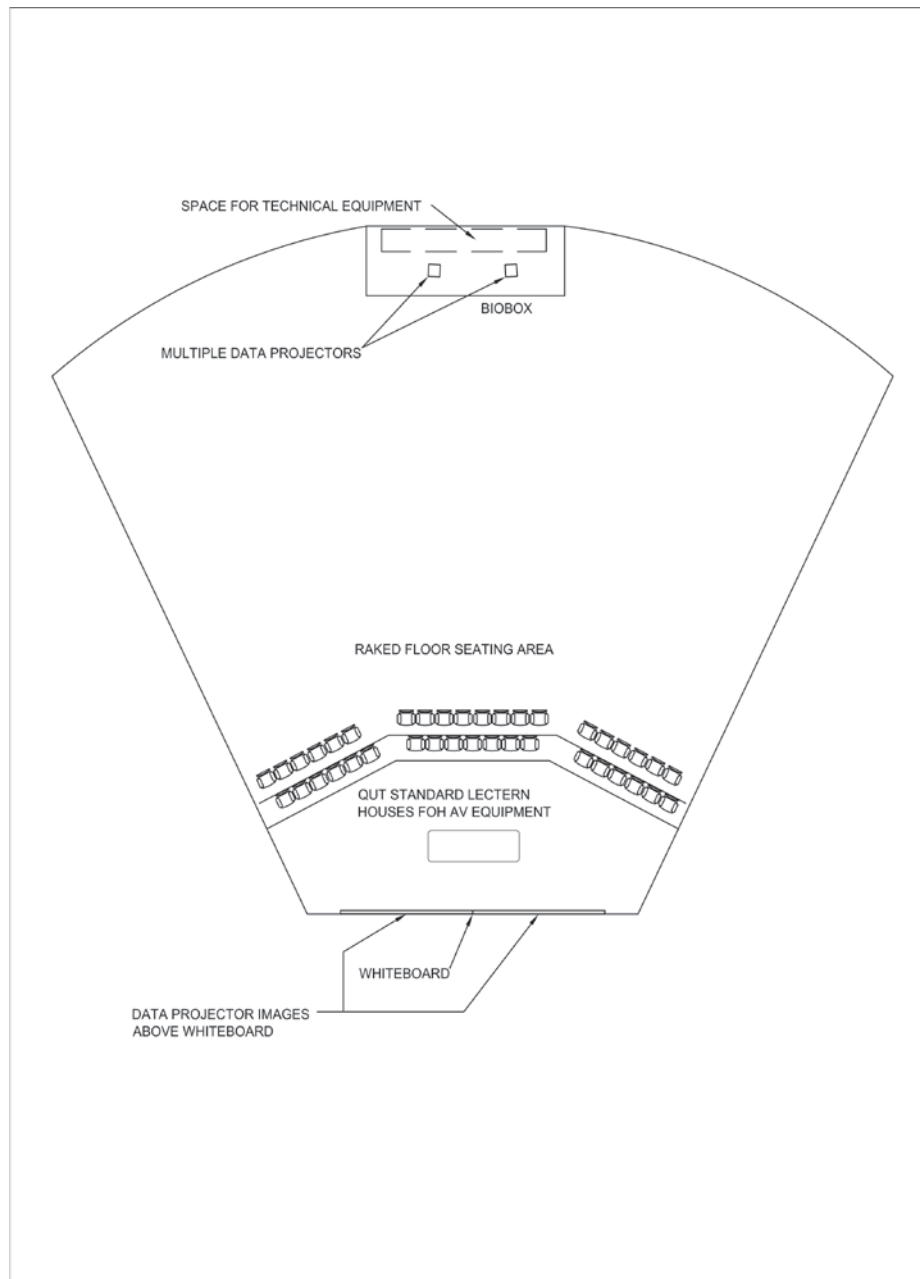


Fig.13 a typical AV6 & AV7 lecture theatre layout.

Appendix 1.

Classification System for Teaching Spaces

Room equipment levels are classified as follows:

Studio CoW – Data projector installed to PBL4 standard, powered speakers, control panel and connection panel.

PBL – PBL4 lectern and equipment setup with the addition of a number of MoCoW's , all connected via collaborative software.

PBL4 – Presentation PC, document camera, Laptop connection, lecture recording via the presentation PC, program sound reinforcement, hearing augmentation and a control system with a touch screen.

PBL5 – As for the PBL4, but with the addition of voice reinforcement and lecture recording via an installed hardware appliance.

AV6 – As for the PBL5, but with multiple projectors.

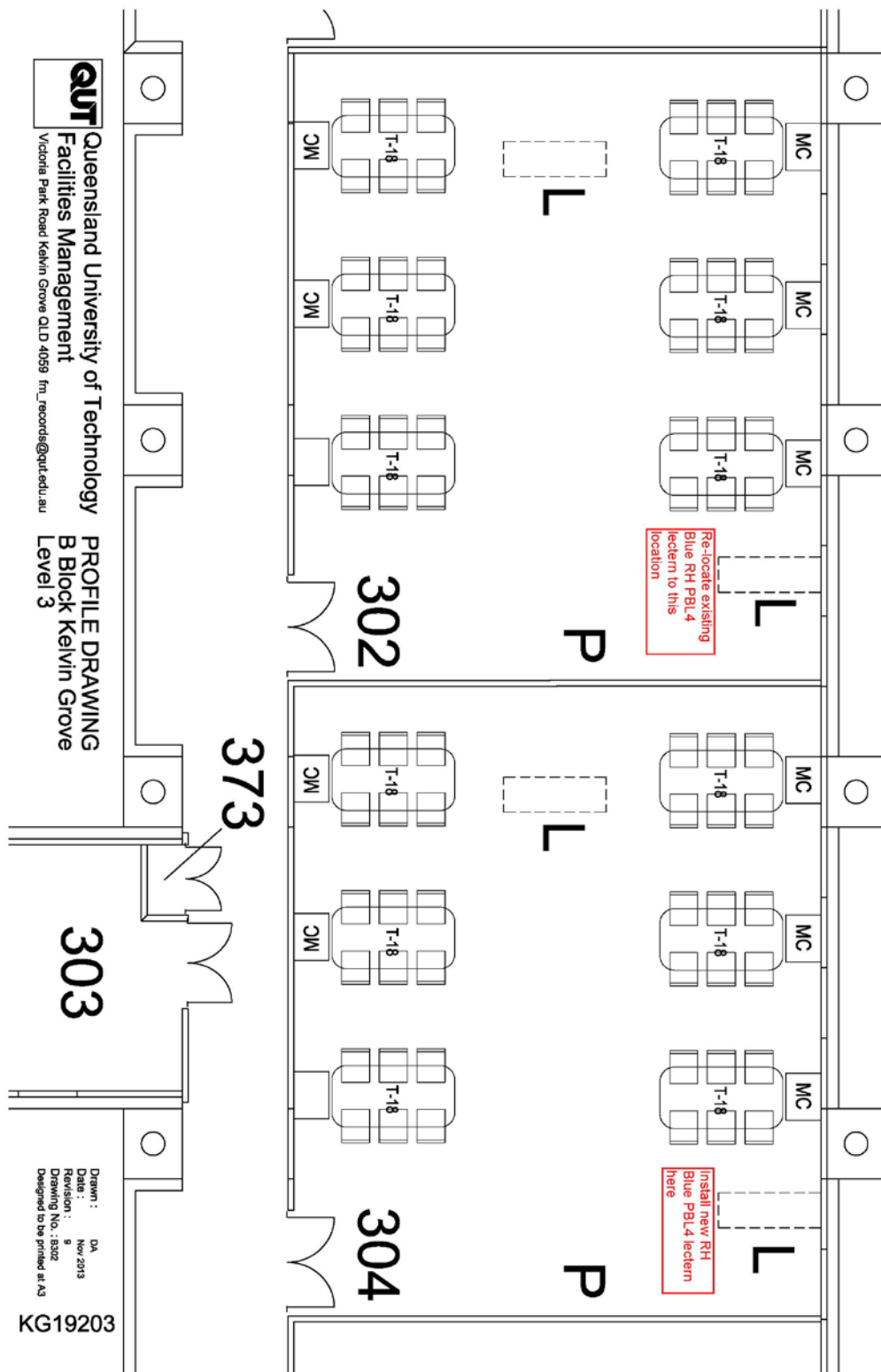
AV7 – As for the AV6, but with surround sound.

MoCoW – **M**obile **C**ollaborative **W**orkstation – Large touch enabled flat panel display mounted on a trolley, with built-in PC, web camera & interactive /collaborative software.

WallCoW – **W**all mounted **C**ollaborative **W**orkstation. This is a wall mounted version of the MoCoW.

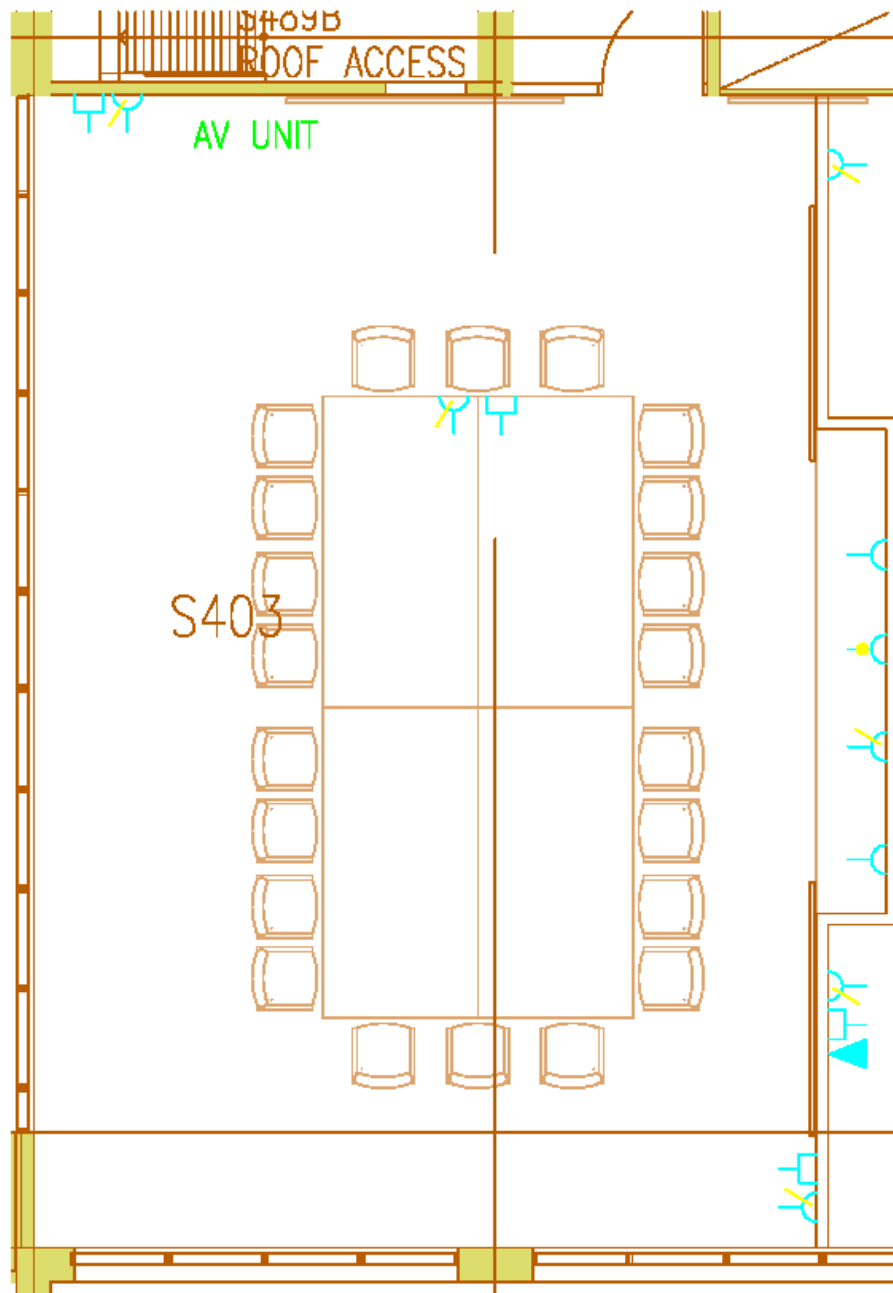
Appendix 2.

Example of a typical PBL4 Classroom floorplan



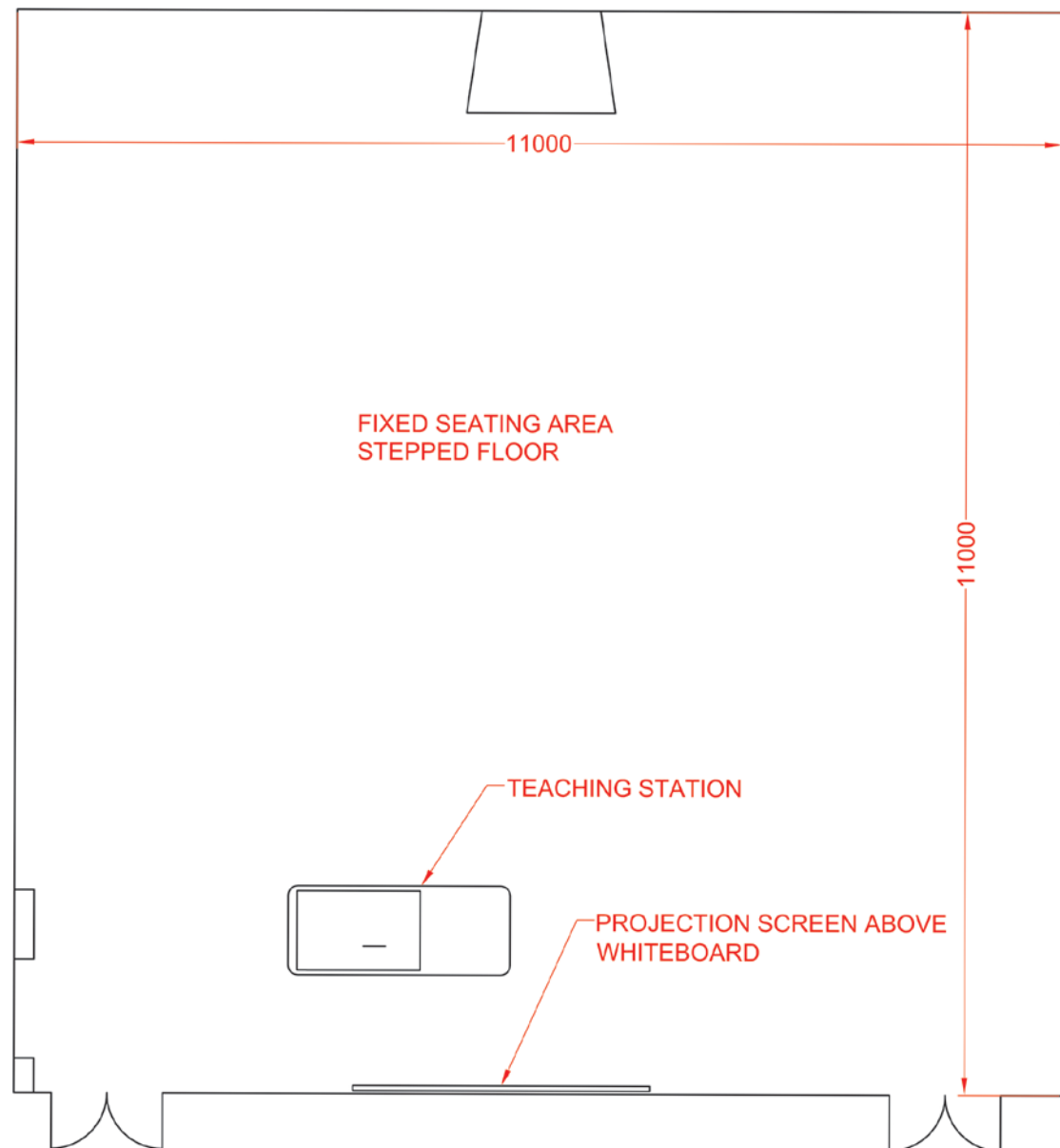
Appendix 3.

Example of a typical Meeting Room floorplan



Appendix 4.

Example of a typical PBL5 Lecture Theatre floorplan



Appendix 5.

Example of a typical AV6 or AV7 Lecture Theatre floorplan

