

University of Wollongong

Commissioning Standard - Building Elements Version 2 – 4 June 2015



VERSION CONTROL SYSTEM

Section Modified	Description of Modification	Version	Organisation	Representative	Date
Throughout	UOW Logo added to headers	V1.01	Asset Technologies Pacific	Tom Poyner	01/12/06
Throughout	Reviewed	V1.02	University of Wollongong	Tony Johnson	16/9/11
Throughout	Document updated to reflect name change from Buildings & Grounds (B&G) to Facilities Management Division (FMD) and rebranding logo	V2	University of Wollongong	Yvonne Butcher	5/3/2012
Throughout	Reviewed throughout by Maintenance with no changes	V2	University of Wollongong	Brent Michell	4/6/2015



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7. BUILDING ELEMENTS

The building elements are the building's shell, structure and finishes and comprise the following:

- Architectural elements;
- Sub-structure;
- External walls and windows;
- Roofing;
- Ceiling and ceiling finishes;
- Internal walls, partitions and finishes;
- Doors, hardware and locks; and
- Furniture and fittings.

7.1 OVERVIEW

The commissioning standard for the building elements involves the following stages:

Stages	Description	Parties Involved
Stage 1	Materials Testing - Performed by the manufacturer	Manufacturer
Stage 2	Construction Inspections - Performed by the project manager during the construction process. The objective is to identify poorly constructed finishes, fittings and areas of the works that do not comply with the provisions of the design specifications. Provided the defect is identified at an early stage, the cost of remedial work and delays to the project program can be minimised;	Project Manager
Stage 3	Final Commissioning - Performed by the contractor and witnessed by the project manager.	Contractor, Project Manager

Table 1 - Commissioning Stages

Final commissioning is the most important part of the quality control process. It is at this stage of the project that the project manager will determine whether the building element is ready to be approved for Practical Completion.

All commissioning inspections are critical and shall be performed to ensure that all building elements have been safely and correctly constructed. It is UOW's objective to complete the commissioning inspections with zero defects remaining in the building.



7.2 COMMISSIONING PROCESS

The following flow diagram depicts the commissioning process:

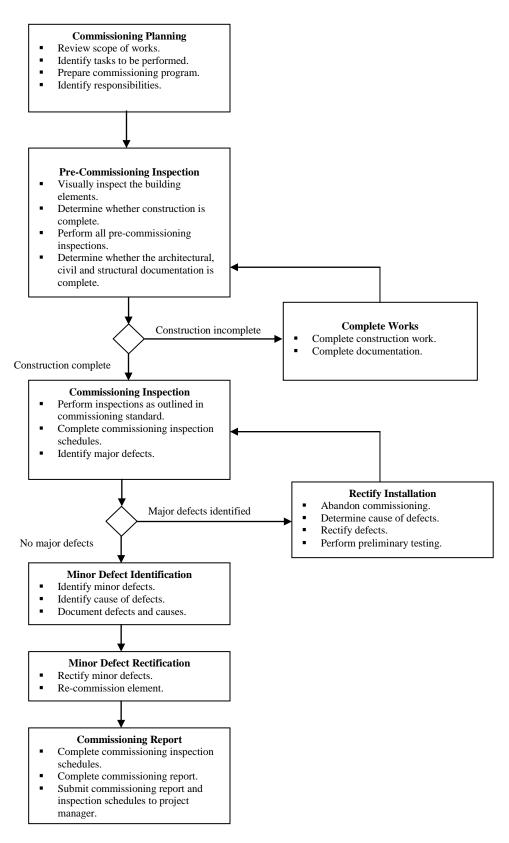


Figure 1 - Commissioning Process Flowchart



7.3 DOCUMENTATION

The contractor shall submit a complete set of documentation to the project manager no later than one (1) week prior to the planned commissioning date. As a minimum the documentation shall comprise:

- a. Architectural, civil and structural drawings;
- b. BCA compliance certification.

The contractor shall obtain written approval from the project manager of the documentation before commencing the commissioning inspections.

7.4 COMMISSIONING TIME AND DATE

The contractor shall submit a program to the project manager containing the proposed time and date for each commissioning inspection at least two (2) weeks prior to the planned commissioning date. The program must contain allowances for defect rectification and remedial works.

The contractor shall obtain written approval of the program from the project manager before commencing the commissioning inspections or tests.

7.5 **PRE-COMMISSIONING INSPECTION**

The contractor shall visually inspect all building elements and verify that all construction has been completed in accordance with the architectural, civil and structural design documentation.

The contractor shall also verify by visual inspection that all building elements are easily accessible for the purposes of routine maintenance.



7.6 COMMISSIONING INSPECTION

Commissioning inspections shall be performed to assess the completeness and quality of the building elements. Each commissioning inspection is specific to the building element being inspected.

All commissioning inspections shall be performed by persons having qualifications and experience suitable for inspection tasks and all associated remedial work.

As each commissioning inspection is performed, the results shall be recorded on the appropriate commissioning schedule. Any comments regarding abnormalities in particular to incomplete construction shall be recorded in the comments section of the commissioning schedule.

If a building element fails an inspection then the commissioning process shall be abandoned. The contractor shall determine the cause of the defect, rectify the defect and recommission the building element. A report shall be provided to the project manager outlining the cause of the defect and the action taken to ensure that the remainder of the building element shall not experience the same defect.

All inspections shall be performed in accordance with relevant codes, regulations and standards. Appropriate safety precautions and procedures must be followed at all times.

7.6.1 External Walls

The contractor shall visually inspect all external walls and verify the following:

- a. Walls have been constructed from the specified materials;
- b. Walls have been constructed correctly to the specified dimensions;
- c. Sealants have been correctly applied and colour matched to the finished surface;
- d. Walls have been correctly finished with the specified paint or wall covering in accordance with the design specification.

7.6.2 Windows

The contractor shall visually inspect all windows and verify the following:

- a. Windows have been constructed correctly to the specified dimensions;
- b. Windows have been correctly fitted;
- c. Intruder protection has been provided (where specified);
- d. All windows have been factory fitted with key window locks;



- e. Provisions for blinds to be installed (where specified);
- f. Windows to non-air-conditioned spaces have been provided with removable flyscreens.

7.6.3 Roofing

The contractor shall visually inspect all roofing and verify the following:

- a. Roofing has been constructed from the specified materials;
- b. Roofing has been constructed correctly to the specified dimensions;
- c. Flashing has been correctly constructed in accordance with manufacturers instructions;
- d. Sealants have been correctly applied and colour matched to the finished surface;
- e. Safe and secure access has been provided to the roof;
- f. Safe roof walkways have been constructed with fall protection devices where necessary;
- g. Roof spaces have been provided with adequate safe access;
- h. Catwalks have been constructed in roof spaces;
- i. Roof spaces have been provided with sufficient lighting to enable safe usage 24 hours a day;
- j. Gutters have been provided with leaf and hail guards;
- k. Overflow relief provisions have been constructed correctly for all roof gutters;
- 1. Sumps in concrete roofs have been provided with leaf and hail guards;
- m. Adequate insulation has been provided in roof spaces;
- n. The roof has been correctly finished with the specified paint or roof covering in accordance with the design specification.

7.6.4 Substructure

The contractor shall visually inspect all substructure and verify the following:

a. Provisions have been provided to prevent water penetration to below ground functional or service areas;



b. Provisions have been provided for the relief of hydrostatic pressure and subsoil drainage.

7.6.5 Ceilings

The contractor shall visually inspect all ceilings and verify the following:

- a. The appropriate type of ceiling tiles have been selected (e.g. pre-painted plasterboard panels in wet areas);
- b. Ceiling fixtures have been correctly constructed;
- c. Eave soffit linings have been correctly constructed;
- d. The ceiling has been correctly finished with the specified paint, ceiling tiles or other material as specified in the design documentation.

7.6.6 Floors

The contractor shall visually inspect all floors and verify the following:

- a. Floor penetrations have been correctly sealed to prevent noise and water penetrating between levels;
- b. Wet areas have been provided with floor waste drains and adequate falls to the drain have been provided;
- c. The fire rating of floors has not been compromised by penetrations;
- d. Laboratories have been provided with threshold seals at all doors to prevent flow of liquid to other areas of the building;
- e. Sealants have been correctly applied and colour matched to floor finishes;
- f. The floor has been correctly finished with the specified carpet, tiles, laminate or paint as specified in the design documentation.

7.6.7 Internal Walls & Partitions

The contractor shall visually inspect all internal walls and partitions and verify the following:

- a. Walls have been constructed correctly to the specified dimensions;
- b. Skirting has been correctly constructed;
- c. Wet areas, such as sinks, have been provided with tiled splashback protection;



- d. Sealants have been correctly applied and colour matched to wall finishes;
- e. Internal walls and partitions have been adequately insulated;
- f. Walls and partitions have been correctly finished with the specified paint or wall covering as specified in the design documentation.

7.6.8 Doors

The contractor shall perform the following inspections and tests for all doors:

- a. Doors have been constructed correctly to the specified dimensions;
- b. Verify that acoustic seals have been correctly installed;
- c. Verify that hinges have been correctly fitted to the door and doorframe;
- d. Verify that the door swings smoothly and easily and sits flush with the doorframe when closed.

7.6.9 Door Hardware

The contractor shall perform the following inspections and tests for all door hardware:

- a. Visually inspect and verify door closers have been correctly installed;
- b. Visually inspect and verify push/pull plates and handles have been correctly installed;
- c. Visually inspect and verify kick plates have been correctly installed;
- d. Visually inspect and verify magnetic hold-open devices have been correctly installed (refer to Fire Services Commissioning Standard for functional tests);
- e. Visually inspect and verify that doorstops have been provided where necessary to prevent damage to walls or other objects;
- f. Verify door closers have been correctly calibrated by opening the door and allowing it to close automatically.

7.6.10 Locks

The contractor shall perform the following inspections and tests for all locks:

a. Verify locks have been correctly installed;



- b. Verify locks comply with UOW's grand master key system;
- c. Verify locking action operates smoothly to securely lock and unlock the door.

7.6.11 Furniture

The contractor shall visually inspect all furniture and verify the following:

- a. Furniture has been installed at the correct location;
- b. Bookshelves for academic and support staff have been correctly constructed in accordance with specific user requirements;
- c. Lecterns have been correctly constructed and provided in lecture theatres;
- d. Fixed seating in lecture theatres has been correctly constructed;
- e. Ten percent of fixed seating in lecture theatres has been provided with left-handed writing tablets and are randomly distributed;
- f. Provisions have been made to accommodate people with disabilities by providing wheelchair spaces in areas of fixed seating;

7.6.12 Fittings & Fixtures

The contractor shall visually inspect all fittings and fixtures and verify the following:

- a. A lockable notice board, not less than 3m in length, has been provided in each lobby;
- b. All signage has been correctly constructed and fixed in accordance with the UOW Sign Standards;
- c. Whiteboards, pin boards and directory boards are of the correct size and type;
- d. Whiteboards, pin boards and directory boards have been correctly constructed and fixed;
- e. Toilet washbasin areas have been provided with the following items:
 - Vanity bench unit with full width mirror;
 - Coat hooks;
 - Paper towel dispenser;
 - Hand towel dispenser with waste receptacle;
 - Soap dispenser over each basin;
 - General power outlet adjacent mirror;
 - Hand driers.



- f. Each toilet cubicle has been provided with the following items:
 - Toilet roll holder;
 - Coat hook.
- g. Each unisex toilet for people with disabilities has been provided with the following items:
 - Grab rails;
 - Mirror;
 - Basin;
 - Toilet roll holder;
 - Coat hook;
 - Hand drier;
 - Wall mounted folding baby change table.
- h. Each shower recess has been provided with the following items:
 - Soap holder;
 - Coat hooks;
 - Fixed bench seat;
 - Shower screen door.
- i. Each kitchenette has been provided with the following items:
 - Sink;
 - Hot and cold running water;
 - Cupboard;
 - Drainer and splashback;
 - Space for a refrigerator;
 - Microwave;
 - Continuous boiling water unit;
 - Towel rail;
 - Utensil drawer.
- j. Each common room kitchen has been provided with the following items:
 - An approved dishwasher;
 - Sink;
 - Hot and cold running water;
 - Cupboard;
 - Drainer and splashback;
 - Space for a refrigerator;
 - Microwave;
 - Continuous boiling water unit;
 - Towel rail;
 - Utensil drawer.
- k. Chilled water drinking fountains have been provided and are accessible to people with disabilities;



- 1. Compactus units have been correctly constructed and that the structural design and capacity of the floor is adequate to support the compactus when fully loaded;
- m. Projection screens have been correctly constructed and provided in lecture theatres, classrooms and seminar rooms;
- n. Where art works are to be located, verify that hanging tracks have been provided for hanging art works;
- o. Where art works are to be located, verify that the correct type of lighting has been provided;
- p. Workstations have been provided with adequate lighting, power and data and communications connections.

7.6.13 Disabled Access

The contractor shall consider accessibility for people with a disability during visual inspection of all areas of the building. The contractor shall pay particular attention to the following:

- a. Provision of adequate disabled access and egress paths;
- b. Provisions for people with disabilities in special areas of the building (e.g. lift controls, toilets, kitchens, etc).

7.6.14 Service Paths

The contractor shall visually inspect all service paths and verify the following:

- a. Adequate service paths have been provided for each building element and building service;
- b. Service paths are easily accessible;
- c. Adequate spare capacity of service paths has been provided for future usage;
- d. Service paths do not compromise the fire separation of building services.



7.7 MINOR DEFECTS

As minor defects are identified during the commissioning inspections, each defect shall be rectified before proceeding to the next inspection. The building element that was found to be defective will be recorded in the commissioning report.

Once rectification is complete, the building element shall be recommissioned and the results recorded in the commissioning schedules.

7.8 COMMISSIONING SCHEDULES

The commissioning schedules shall be completed in accordance with this standard. Where building elements need to be recommissioned, the recommissioning results shall be recorded. At the completion of the commissioning inspections, UOW shall have one complete set of commissioning schedules containing all building elements that are free of defects.



7.8.1 Building Elements Commissioning Schedule - External Walls

Building Number:						
Test/Inspection	Commi	ssioning ults Fail	Test/Inspection Reference Notes	Defect Details		
Construction						
Type of Materials						
Sealants						
Wall Finishes						

Commissioning Contractor Name: ______ Commissioning Contractor Representative: ______



7.8.2 Building Elements Commissioning Schedule - Windows

Building Number:					
Test/Inspection	Commi Res	ssioning sults	Test/Inspection Reference Notes	Defect Details	
	Pass	Fail			
Construction					
Type of Materials					
Intruder Access Protection					
Window Locks					
Window Blinds					
Flyscreens					
Window Access for Cleaning					

Commissioning Contractor Name: ______ Commissioning Contractor Representative: ______



7.8.3 Building Elements Commissioning Schedule - Roofing

Building Number: Commissioning Date:	_			
Commissioning Date:	//			
		ssioning		
Test/Inspection	Pass	sults Fail	Test/Inspection Reference Notes	Defect Details
Construction				
Type of Materials				
Flashing				
Sealants				
Roof Access				
Fall Protection Devices				
Roof Space Access				
Roof Space Catwalks				
Roof Space Lighting				
Gutters				
Overflow Relief				
Leaf & Hail Guards				
Insulation				
Roof finish				

Commissioning Contractor Name: _____

Commissioning Contractor Representative:



7.8.4 Building Elements Commissioning Schedule - Substructure

Building Number:		B	uilding Name:	_
Building Number: Commissioning Date: _	//			
Test/Inspection	Commis Res	ssioning ults	Test/Inspection Reference Notes	Defect Details
	Pass	Fail		
Construction				
Water Penetration Protection				
Subsoil Drainage				
Hydrostatic Pressure Relief				

Commissioning Contractor Name: ______ Commissioning Contractor Representative: ______



7.8.5 Building Elements Commissioning Schedule - Ceilings

Test/Inspection		ssioning ults	Test/Inspection Reference Notes	Defect Details
P	Pass	Fail		
Construction				
Type of Materials				
Ceiling Fixtures				
Eave Soffit Linings				
Ceiling Finishes				

Commissioning Contractor Name:

Commissioning Contractor Representative:



7.8.6 Building Elements Commissioning Schedule - Floor

Building Number:		Bu	ilding Name:	
Building Number: Commissioning Date:	//	_		
Test/Inspection	Res	ssioning sults	Test/Inspection Reference Notes	Defect Details
	Pass	Fail		
Construction				
Floor Penetration Seals				
Floor Waste Drains				
Floor Penetration Fire Rating				
Laboratory Threshold Seals				
Sealants				
Floor Finishes				

Commissioning Contractor Name: ______ Commissioning Contractor Representative: ______



7.8.7 Building Elements Commissioning Schedule - Internal Walls & Partitions

Building Number:		B	uilding Name:	_
Building Number: Commissioning Date: _	//			
Test/Inspection	Res	ssioning sults	Test/Inspection Reference Notes	Defect Details
Construction	Pass			
Skirting				
Splashback Protection				
Sealants				
Insulation				
Wall Finish				

Commissioning Contractor Name: ______ Commissioning Contractor Representative: ______



7.8.8 Building Elements Commissioning Schedule - Doors

Building Number:						
Test/Inspection	Commis Res			Defect Details		
rest/hispection	Pass	Fail	Test/Inspection Reference Notes	Derect Details		
Door Number:						
Construction						
Acoustic Seals						
Hinges						
Door Number:						
Construction						
Acoustic Seals						
Hinges						
Door Number:						
Construction						
Acoustic Seals						
Hinges						

Commissioning Contractor Name: ______ Commissioning Contractor Representative: ______



7.8.9 Building Elements Commissioning Schedule - Door Hardware

Building Number: Commissioning Date:	//	Bui	ilding Name:				
Test/Inspection	Commis Res Pass	ssioning sults Fail	Test/Inspection Reference Notes	Defect Details			
Door Number:							
Construction							
Door Closers							
Push/Pull Plates & Handles							
Kick Plates							
Magnetic Hold-open Devices							
Doorstops							
Door Number:							
Construction							
Door Closers							
Push/Pull Plates & Handles							
Kick Plates							
Magnetic Hold-open Devices							
Doorstops							

Commissioning Contractor Name: ______ Commissioning Contractor Representative: ______

Project Manager Name: Project Manager Reference:



7.8.10 Building Elements Commissioning Schedule - Locks

Building Number: Building Name: Commissioning Date:					
Test/Inspection	Commi	ssioning ults Fail	Test/Inspection Reference Notes	Defect Details	
Door Number:					
Construction					
Compliance with UOW's Grand Master Key System					
Locking Action					
Door Number:					
Construction					
Compliance with UOW's Grand Master Key System					
Locking Action					
Door Number:					
Construction					
Compliance with UOW's Grand Master Key System					
Locking Action					
Commissioning Contractor Nan	ne:			Project Manager Name:	

Commissioning Contractor Representative:



7.8.11 Building Elements Commissioning Schedule - Furniture

 Building Number:

 Commissioning Date:

Test/Inspection	Res	ssioning ults	Test/Inspection Reference Notes	Defect Details
	Pass	Fail		
Location				
Bookshelves				
Lecterns				
Fixed Seating				

Commissioning Contractor Name:

Commissioning Contractor Representative:



7.8.12 Building Elements Commissioning Schedule - Fittings & Fixtures

Building Number:	Building Name:
Commissioning Date://	

Test/Inspection	Res	ssioning ults	Test/Inspection Reference Notes	Defect Details
	Pass	Fail		
Lockable Notice Board				
Signage				
Whiteboards, Pin Boards & Directory Boards				
Toilet Washbasin Areas				
Toilet Cubicles				
Unisex Disabled Toilets				
Shower Recesses				
Kitchenettes				
Common Room Kitchens				
Chilled Water Fountains				
Compactus Units				
Projection Screens				
Art Work Areas				
Workstations				

Commissioning Contractor Name: _____

Commissioning Contractor Representative:



7.8.13 Building Elements Commissioning Schedule - Disabled Access

Building Number:		B	uilding Name:	
Building Number:				
Test/Inspection	Commissioning Results		Test/Inspection Reference Notes	Defect Details
	Pass	Fail		
Disabled Access & Egress				
Lifts				
Toilets				
Showers				
Kitchens				

Commissioning Contractor Name: ______ Commissioning Contractor Representative: ______



7.8.14 Building Elements Commissioning Schedule - Service Paths

Building Number:				
Test/Inspection	Commissioning Results		Test/Inspection Reference Notes	Defect Details
	Pass	Fail		
Construction				
Accessibility				
Spare Capacity				
Fire Separation				

Commissioning Contractor Name: _____

Commissioning Contractor Representative: