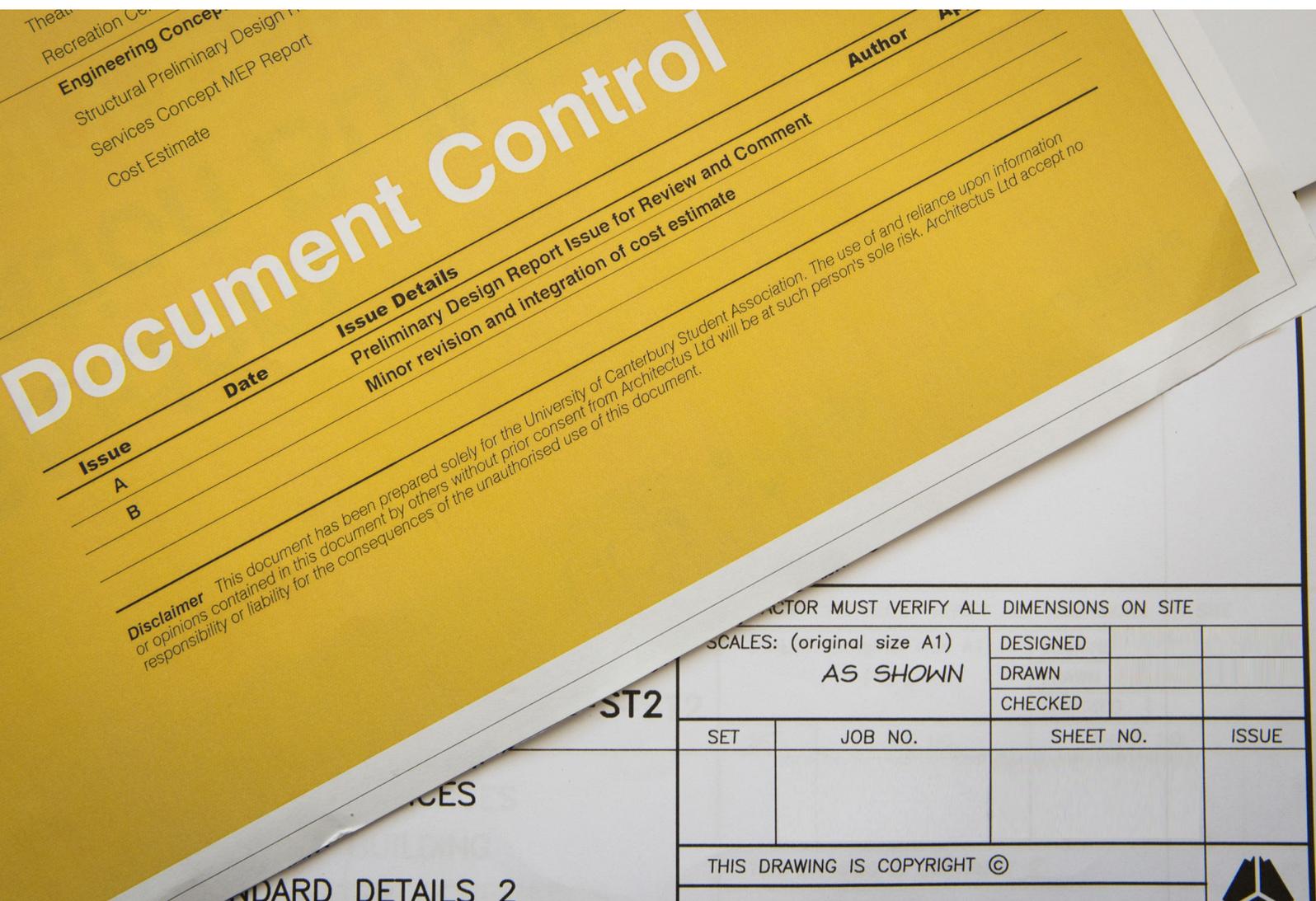


Section 7

Document Standards.



Design Standard Guidelines Index:

- 01 General
- 02 Architecture
- 03 Audio Visual
- 04 Civil
- 05 Communication Cabling
- 06 Design for access and mobility
-  07 Documentation Standards
- 08 Electrical
- 09 Environmentally Sustainable Design (ESD)
- 10 Fire and Life Safety
- 11 Interior Design
- 12 Hydraulics
- 13 Infrastructure
- 14 Landscaping
- 15 Lifts
- 16 Mechanical
- 17 Metering and Controls
- 18 Security
- 19 Signage and Wayfinding
- 20 Structure

Revision History

Revision Number	Description	Section Owner	Date
Issue 1	Original Draft	-	-
Issue 2	Internal Review	-	-
Issue 3	First public circulation	-	October 2016
Issue 4	Major rewrite	Rob Oudshoorn	September 2019
Issue 5	Minor corrections 7.4.4	Rob Oudshoorn	February 2020
Issue 6	Minor corrections 7.4.4	Rob Oudshoorn	June 2020
Issue 7	Update and clarification.	Tony Webber	July 2022

Current Document Acceptance

Authored	Approved	Date
Dazz Gibson	Tony Webber	July 2022

Key Updates from Previous Issue

Revision Item	Details
7.2 Project Milestone Deliverables	Reference to OmTrak execution plan removed.
7.2.6 Final Construction Issue	iDGN deliverable removed.
7.2.7 As-Built Issue	iDGN deliverable removed. O&M approval clarified. External links clarified. Drawing links clarified.
7.3.3 File Naming Components	Discipline Hazardous Substances (Z) added.
7.4.1 Document Specific Requirements	Exception scanned signed document with OCR added.
7.4.5 File Type and Setup Requirements	AutoCAD DWG versions updated. Vertical Christchurch Drainage Datum requirement added. Reference to iDGN removed.
7.5.* Operations & Maintenance Manuals	All references to OmTrak execution plan altered to Project execution plan.
7.5.2 Manual Content and Format	Drawing set cover sheet with drawing index added. Hardcopy requirement removed.

Contents

	7.1 Overview	1
	7.1.1 Purpose	1
	7.1.2 General	1
	7.2 Project Milestone Deliverables	2
	7.2.1 Resource Consent Issue	2
	7.2.2 Building Consent Issue	2
	7.2.3 Developed Design 90% Issue	2
	7.2.4 Contract/Tender Issue	2
	7.2.5 First Construction Issue	2
	7.2.6 Final Construction Issue	2
	7.2.7 As-Built Issue	2
	7.3 Deliverable File Naming	3
	7.3.1 Document File Naming	3
	7.3.2 Drawing File Naming	3
	7.3.3 File Naming Components	3
	7.3.4 Document Specific Naming Components	3
	7.3.5 Drawing Specific Naming Components	3
	7.4 Deliverable File Content	4
	7.4.1 Document Specific Requirements	4
	7.4.2 Drawing Specific Requirements	4
	7.4.3 Working Drawing Title Block Requirements	4
	7.4.4 Individual Working Drawing Requirements	4
	7.4.5 File Type and Setup Requirements	5
	7.4.6 Typical Drawing Requirements	5
	7.4.7 As-Built Drawing Requirements	5
	7.4.8 BMS As-Built Drawing Requirements	6
	7.5 Operations & Maintenance Manuals	7
	7.5.1 OmTrak System	7
	7.5.2 Manual Content and Format	7
	7.5.3 Asset Schedule	7
	7.5.4 Mandatory Maintenance Schedules	7
	7.5.5 Commissioning and Testing	7
	7.5.6 Provision of Training	7
	7.5.7 Facilities Management Staff Requiring Training	8
	7.6 BIM Requirements	9
	7.6.1 Project BIM Manager	9
	7.6.2 Project BIM Documents	9
	7.6.3 Consultant Agreements	9
	7.6.4 Project BIM Document Requirements	9
	7.6.5 Level of Development (LOD)	9
	Compliance Checklist	10

7.1 Overview

7.1 Overview

7.1.1 Purpose

This section of the Design Standard Guidelines is intended to be read and implemented during design in conjunction with **Section 01 – General** and any project specific brief and agreements.

7.1.2 General

Facilities Management Drawing Office (FMDO) represents the University of Canterbury as the end client repository, responsible for holding and maintaining all documents and drawings produced by consultants, contractors and sub-contractors during an assets lifecycle. This is from enabling works through construction to final demolition, for the purpose of operating, maintaining and perpetual upgrading of Infrastructure, Building and Ground assets.

All documents and drawings produced by consultants, contractors and sub-contractors for Tender, Construction, As-Built, Operation and Refurbishment of University of Canterbury's: Infrastructure, Buildings and Grounds assets shall be issued to the University of Canterbury Project Manager (UCPM). This is in addition to the issue's intended party or parties, during a projects documentation. Once the UCPM has performed a QA check and is satisfied with the contents of the issue, the UCPM shall deliver project milestone issues to FMDO.



7.2 Project Milestone Deliverables

Unless a specific discipline is stated, the following shall be provided by each discipline consultant, main contractor and sub-contractors. The method of delivery shall be OmTrak. Note the following is the minimum requirement.

7.2.1 Resource Consent Issue

- PDF of local authority's approval, including all drawings and documents submitted in application, by submitter.

7.2.2 Building Consent Issue

- PDF of local authority's approval, including all drawings and documents submitted in application, by submitter.

7.2.3 Developed Design 90% Issue

- DWG of Architectural floor plans, one file per level of building.
- Facilities Management Drawing Office shall number rooms and issue UC room numbers to Architect, via UCPM.
- Architect shall implement UC room numbers on all drawings and issue to other consultants, within 5 working days. All consultants shall implement UC room numbers on all drawings prior to issuing Contract, Tender, Construction and As-built drawings.

7.2.4 Contract/Tender Issue

- PDF of all documents and drawings in the contract set, note this maybe separate or identical to the tender set.
- PDF of all documents and drawings in the tender set, note this maybe separate or identical to the contract set.

7.2.5 First Construction Issue

Required before commencing work onsite.

- PDF of all drawings sheets per discipline, including a cover sheet listing all drawings present in issue.
- DWG of Architectural floor plans, one file per level of building, with all room numbers shown.
- XLSX (Excel file) of Architectural room area schedule measured to 2 decimal places of UFA and GFA.
- PDF of all Specifications.

7.2.6 Final Construction Issue

Required before handover and UC occupation.

- PDF & DWG of all drawings sheets per discipline, including a cover sheet listing all drawings present in issue.
- DWG of Architectural floor plans, one file per level of building, with all room numbers shown. Note this is in addition to drawing sheets.
- XLSX (Excel file) of Architectural room area schedule measured to 2 decimal places of UFA and GFA.
- PDF of all updated Specifications.
- Requirement for BIM projects only. Authoring application RVT or PLA or DGN (native BIM) files, at least one file per discipline provided by consultants.
- Requirement for BIM projects only. IFC, at least one file per discipline provided by consultants.
- Operations & Maintenance Manuals with consultant approval complete. One single multi page PDF per trade/discipline, delivered through OmTrak. These manuals shall be self-contained, with no external links outside of OmTrak. Drawing links shall be to one zip file (containing multiple PDFs and DWGs).

- If applicable, PDF of Certificate of Public Use issued by local authority.

7.2.7 As-Built Issue

Required for practical completion and before final retention is released.

- PDF & DWG of all drawings sheets per discipline/trade, including a cover sheet listing all drawings present in issue
- DWG of Architectural floor plans, one file per level of building. Note this is in addition to drawing sheets.
- XLSX (Excel file) of Architectural room area schedule measured to 2 decimal places of UFA and GFA.
- PDF of all finalised Specifications.
- Requirement for BIM projects only. Authoring application RVT or PLA or DGN (native BIM) files, at least one file per discipline provided by consultants and or main contractor.
- Requirement for BIM projects only. IFC, at least one file per discipline provided by consultants and or main contractor.
- PDF of Operations & Maintenance Manuals with UCPM (or delegate) approval complete. One single multi page PDF per trade/discipline, delivered through OmTrak. These manuals shall be self-contained, with no external links outside of OmTrak. Drawing links shall be to one zip file (containing multiple PDFs and DWGs).
- PDF of Certificate of Practical Completion issued by local authority.
- PDF's of all other documents issued by local authority.
- PDF of all marked up Shop drawings.
- PDF of Asbestos Clearance Certificates.



7.3 Deliverable File Naming

7.3 Deliverable File Naming

All files issued to the UCPM/FMDO shall conform to the following naming convention. Revision states and dates are not to appear in file names, as only the latest (or last) version of a file shall be kept.

7.3.1 Document File Naming

Convention:

<UC Asset Code>_<Document Type>_
<Discipline><Document No>.<File Extension>

Example: EN01_RPT_A001.PDF

7.3.2 Drawing File Naming

Convention:

<UC Asset Code>_<Discipline>
<Sheet Series>-<Sheet No>.<File Extension>

Example: EN01_A01-001.PDF

7.3.3 File Naming Components

- **UC Asset Code** (Building Code)
Is a unique static code issued by Facilities Management Drawing Office via UCPM, and shall be present on all documents / drawings.
Minor detached assets such as Hazardous Substance (Dangerous Goods) Stores shall be documented as separate packages of work and named using their specific unique UC Asset Code. Specifically, drawing file naming used to document a minor asset, shall not use a neighbouring (major) building's asset code.

- **Document Type**
Is a 3 letter short form of with the following meaning:
CAN Consultant Advice Notice
NTT Notice To Tenderers
RPT Report
Full list of document types shall be defined in the Project execution plan, by the UCPM.

- **Discipline**
Single capital letter representing the authoring discipline of the file. Note when same discipline companies partner together (in association with) on a project, they shall issue as one organisation. The letter shall conform to the following naming convention:
A Architectural
B Controls (BMS)
C Civil
D Data (Telecommunications)
E Electrical
F Fire Protection
G Geotechnical
H Hydraulic (Plumbing and Drainage)
I Interior Design
J *Reserved for future use*
K *Reserved for future use*
L Landscape Architecture
M Mechanical
N *Reserved for future use*
O *Reserved for future use*
P Master Planning / Urban Design
Q Acoustic
R *Reserved for future use*
S Structural
T Lift
U Reserved for UC (FMDO) use
V Survey
W *Reserved for future use*
X Other Disciplines
Y Security
Z Hazardous Substances

7.3.4 Document Specific Naming Components

- **Document No**
Is a unique number per document type. Where an error is noted in a document it can be reissued using the same file name.
- **Multiple sections**
Documents with multiple sections are to include a cover page and contents page. Each section in the contents page is to be numbered and bookmarked (for navigation in a PDF).

7.3.5 Drawing Specific Naming Components

- **Sheet Series**
Like drawing types shall be grouped together in a series.
Example series numbers reserved for:
00 Location Plans
01 Floor Plans
02 Elevations
03 Sections
04 Details
05 Diagrams
- **Sheet No**
Is a unique three digit number per Sheet Series.



7.4 Deliverable File Content

7.4 Deliverable File Content

7.4.1 Document Specific Requirements

- **File Name**
The documents File Name shall be present on the first page of the document (excluding file extension).
- **Date**
The date of publishing (printing to PDF) shall be present on the first page of the document and not present in its file name.
- **Page Numbering**
Page # of # shall appear in the footer/bottom of each page. Initial View - Layout and Magnification settings shall be set to:
Navigation tab = "Bookmarks Panel Page"
Page layout = "Single Page"
Magnification = "Fit Page"
- All text shall be searchable, scanned/rasterised documents are not acceptable. Exception hand signed documents shall be delivered as scanned searchable PDFs with Optical Character Recognition (OCR) enabled.
- Document transmittals shall list the titles of all documents contained in an issue (excluding drawings), one title/item per line and shall be provided in a Microsoft Word format.
- Drawing registers shall list the following details of each drawing contained in an issue: Sheet number, Sheet Name, Scale and Revision State. One drawing per row and shall be provided in a Microsoft Excel format.

7.4.2 Drawing Specific Requirements

- Sheet size shall be either ISO A1 or A3, all other sheet sizes are not acceptable.
- Reduced size (A1 to A3) drawings are not acceptable.
- A1 drawings shall have a 12mm (empty) border.
- A3 drawings shall have a 6mm (empty) border.
- A1 drawings shall have a binding margin of 50mm where no text or drawing line work (other than title block line work) shall be present.
- All text shall be searchable, scanned/rasterised drawings are not acceptable.
- Title block shall be present.
- **Working Drawing Title Block**
A unified title block is to be setup by the lead consultant in consultation with the other consultants. All working drawings shall be issued using this unified title block.
- **Sketch Drawing Title Block**
Unified sketch title blocks are not required. Sketch title blocks may be used up to (but not including) tender.

7.4.3 Working Drawing Title Block Requirements

- Note the following is the minimum requirement and maybe added to:
- Client Logo
 - Project Title
 - Consultant list
 - Publishing Company name, logo and contact details

7.4.4 Individual Working Drawing Requirements

- Note the following is the minimum requirement, each bullet point item shall not be altered. New items maybe introduced with the permission of UCPM (with the approval of FMDO).
- **Drawing Title**
When a drawing type is a plan, the first line of the drawings title shall state the level which it is documenting:

LEVEL 00	(basement)
LEVEL 01	(ground)
LEVEL 02	(first floor)
LEVEL 03	(second floor)
LEVEL 04	(third floor)
LEVEL 05	(fourth floor)
LEVEL 06	(fifth floor)
LEVEL 07	(sixth floor)
LEVEL 08	(seventh floor)
LEVEL 09	(eighth floor)

Note: Mezzanine floors belong to the floor directly below.
LEVEL 01 MEZZANINE (mezzanine floor above ground)
LEVEL 02 MEZZANINE (mezzanine floor above first floor)

- **Drawing Status**
Only the following drawing statuses shall be used:
Preliminary
Tender
Construction
As-Built
All drawings are to be considered Preliminary unless issued for the purpose of Tender, Construction or final As-Built record.
- **Scale**
Scale of printing/plotting at intended ISO page size.
Example:
1:100 @ A1
1:50 @ A1
1:200 @ A3
1:100 @ A3
- **Date**
The date of publishing (printing to PDF) DD/MM/YYYY.
Example: 19/07/2022
Note: if a consultant is unable to automate changes to the drawings date, it shall be set manually.
- **Drawn**
Initials of person compiling/drawing/modelling drawings content.
- **Checked**
Initials of person checking drawings content.
- **Approved**
Optional field for engineering requiring an approval process. Initials of person approving drawings content.
- **Drawing No**
Drawing No shall equal the file name excluding the file extension. It is a serial number and shall contain both alpha and numeric characters. The Drawing No shall be present on the bottom right corner of the drawing.
Drawings of plans with same or similar scale shall be numbered in consecutive order, and numbering shall not restart per level of building. This is particularly important for floor plan drawings.
Example:

Drawing No	Drawing Title	Scale
EN01_A01-001	Level 01 Floor Plan	1:100
EN01_A01-002	Level 02 Floor Plan	1:100
EN01_A01-003	Level 03 Floor Plan	1:100
EN01_A01-011	Level 01 Part Plan	1:50
EN01_A01-012	Level 01 Part Plan	1:50
EN01_A01-013	Level 02 Part Plan	1:50
EN01_A01-014	Level 02 Part Plan	1:50
EN01_A01-015	Level 03 Part Plan	1:50
EN01_A01-016	Level 03 Part Plan	1:50
EN01_A01-021	Level 01 Detail Plan	1:25
EN01_A01-022	Level 01 Detail Plan	1:25
- **Revision**
Preliminary drawings shall be first issued as A, then B and so on. If Z is reached, subsequent revision shall be called AC, then AD and so on. Tender drawings shall be issued as 0 (zero). Construction drawings shall be first issued as 1, then 2 and so on. The revision AB is reserved for final As-Built status. The revision state shall be present on the bottom right corner of the drawing, next too and to the right of the Drawing No.



7.4 Deliverable File Content

Revision History Notes

Revision history notes shall be present on the top right corner, with a maximum history of ten issues to be kept. At construction issue, revision notes history is to be cleared. Revision history notes shall be comprised of Rev(ision), Date, Reason for Issuing.

Example:

Rev	Date	Reason for Issuing
A	04/03/2019	Preliminary Issue
B	08/04/2019	90% Developed Design
C	12/05/2019	Client Approval
0	16/06/2019	Tender Issue
1	20/07/2019	Construction Issue
2	24/08/2019	Construction Issue
AB	28/09/2019	As-Built Issue

Clouding

No clouds are to be present on the first Preliminary issue of a drawing. All changes on subsequent Preliminary issues of drawings shall be clouded and all previous issue clouds are to be deleted.

No clouds are to be present on the first Tender issue of a drawing. All changes on subsequent Tender issues of drawings shall be clouded and all previous issue clouds are to be deleted.

No clouds are to be present on the first Construction issue of a drawing. All changes on subsequent Construction issues of drawings shall be clouded and all previous issue clouds are to be deleted.

No clouds are to be present on the first As-Built issue of a drawing. All changes on subsequent As-Built issues of drawings shall be clouded and all previous issue clouds are to be deleted.

Drawing cross referencing

Drawing cross referencing, section markers and detail callouts shall be <Discipline><Sheet Series><Sheet No>. They are not to contain the UC Asset Code.

Example:

A03-001
A03-012
A04-001
A04-057

All consultants using Revit, shall agree (by consensus) to the use of one version. All Revit Data shall be delivered in this one version as Decentralised models.

7.4.6 Typical Drawing Requirements

Typical drawings expected to be delivered, include but not limited to:

- Acoustic, Architectural, Controls (BMS), Civil, Data (Telecommunications), Electrical, Fire Protection, Geotechnical, Hydraulic (Plumbing and Drainage), Landscape, Lift, Mechanical, Security, Structural, Survey and any other services drawings relevant to the project.
- Floor and roof plans clearly annotated documenting (including dimensions): floor finishes, walls, doors, partition types and furniture layouts.
- Reflected Ceiling Plans.
- External and internal elevations.
- Full, part and detailed sections.
- Consolidated and co-ordinated drawings showing all passive fire requirements, with all fire rated doors, windows and walls (cells) clearly annotated.
- Fully detailed drawings and schematics documenting electrical installation.
- Plans with operating information and schematics appropriate to the long term maintenance of the facility and statutory requirements.
- As installed locations of all building elements, plant and equipment. For services showing dimensions, types and location of equipment, cables, piping and ductwork in relation to permanent site features and other underground services. Connection points to existing services shall be clearly indicated on all drawings. Including relationship to building structure and other services, and changes made during the commissioning period.
- Schematic/diagrammatic drawings of each system showing piping and wiring, and principal items of equipment.
- Functional schematic diagrams for "Electrical for Mechanical" illustrating the electrical relationship between items of equipment, the sequence of operation and the control and protective functions.

7.4.5 File Type and Setup Requirements

BIM project deliverables shall conform to all CAD related requirements, unless explicitly stated otherwise.

- All Native files used to produce Drawing and O&M Manual PDF deliverables, shall be provided in an unaltered state.
- All PDF's shall be version 1.7 or higher.
- All files shall be unlocked and in no way restricted.
- All CAD data shall be delivered in DWG version AC1027 (AutoCAD 2013-2017) or AC1032 (AutoCAD 2018-2023) or DGN version V8. AC1027 is preferred.
- All CAD setup and configuration files used in generating Printing/Plotting drawings, shall be provided in an unaltered state.
- All CAD data shall be Linked/Hotlinked/XREF/Referenced using relative paths and shall not contain drive letters.
- All CAD data shall be drawn/modelled at one to one. Scaling shall occur in paper space.
- All consultants using AutoCAD shall agree to:
Only use standard AutoCAD font styles and line types.
All blocks and symbols to be created on layer 0.
- All CAD data shall be drawn in location and alignment to NZGD2000 Mount Pleasant local circuit coordinate system (horizontal X,Y) & Christchurch Drainage Datum (vertical Z).
- All BIM data is exempt from the NZGD2000 Mount Pleasant and Christchurch Drainage Datum alignment. Instead True North, Project North & Project Location shall be defined, to allow as close as possible alignment with the NZGD2000 coordinate system and the Christchurch Drainage Datum.

7.4.7 As-Built Drawing Requirements

All As-Built Drawings shall detail precisely and accurately what has physically been built in the building and can be segregated according to service areas. Services areas are, but not limited to: Acoustic, Architectural, Controls (BMS), Civil, Data (Telecommunications), Electrical, Fire Protection, Geotechnical, Hydraulic (Plumbing and Drainage), Landscape, Lift, Mechanical, Security, Structural, Survey.

All As-Built drawings shall include relevant pertinent features such as: roadways, paths, steps, signs and street lighting poles, buildings, manholes and pits. These features shall be clearly and easily identifiable in a reduced size A3 printed copy.

Any incorrect information that may exist on the base plan shall not be shown as part of the As-Built drawing.

Relevant information such as service type, material type, diameters, connection positions to existing infrastructure and invert elevations are to be clearly annotated.

All details shown shall be accurate and relevant to surrounding features.

All Cable routes shall be marked on site drawings defining the exact route.



7.4 Deliverable File Content

7.4.8 BMS As-Built Drawing Requirements

Building Management System (BMS) documentation shall include but not be limited to the following:

- Function Control Description to describe the operation of the plant in plain English.
- Copies of the revised I/O Schedules and controller schematics
- Detailed auxiliary/3rd BACnet device communication topology schematics
- All BACnet addressing and configuration shall be fully documented in a dedicated section of the documentation, this includes:
 - All BACnet controller IP addresses
 - All BACnet instance numbers
 - All BACnet network numbers
- Complete As-Built schematics shall be provided within each mechanical board showing both electrical controls and BMS controller I/O.



7.5 Operations & Maintenance Manuals

7.5.1 OmTrak System

The university is now producing and using electronic Operation and Maintenance (O&M) Manuals and is utilising the WEBFM OmTrak system to deliver this format. The general requirements of this system are found in the UC P&G Specification with the specific project requirements detailed within the Project execution plan. Contractors unfamiliar with this system shall take particular note.

The Project execution plan shall detail all the standard UC requirements for the use of the complete OmTrak documentation system, including O&M manuals. The standard templates, permissions etc contained within it shall be confirmed at the project outset. The UCPM and the Principal Contractor shall ensure ongoing compliance as appropriate.

The O&M manuals shall contain all necessary information to enable UC staff or representatives to carry out routine operations and cost-effective maintenance of the systems. O&M manuals are required to comply with NZS5902 with particular attention to Part 5 Engineering Services.

Operating and maintenance instruction shall be concise and clear and such that unqualified personnel can operate the system, but maintenance instructions shall assume that apart from elementary procedures (e.g. changing filters), the work shall be carried out by qualified personnel. It is not therefore necessary to itemise commonly used procedures that qualified personnel would follow.

7.5.2 Manual Content and Format

The Principal Contractor shall upload content into the O&M Manuals as searchable PDF files. The PDF O&M Manual shall also include a full size drawing set, in colour. The first drawing shall be a cover sheet, containing an index listing all drawing numbers and names.

The Principal Contractor shall provide the original Word, Excel, Visio, etc. files (unlocked and unrestricted) that were used to produce PDFs.

The Principal Contractor shall provide all reports, certificates and warranties (with actual signature and then scanned to PDF with Optical Character Recognition) associated with the project and may include:

- List Cabinet layout diagrams.
- Schematic designs and switchboard layouts.
- Structured Cabling System frame layouts.
- As-Built for fibre splicing, fibre cable blows and fibre duct installations.
- Testing of MTHW - All pipe work is to be static tested to 1500 K.P.A. before insulation. Test pressure to hold for 1 hour and be sited by University of Canterbury.
- A schedule of all fire rated walls and doors contained in the maintenance manuals.
- The installer shall supply Engineering Design Safety and Installation certificates and final plans to the University.
- Test certificates.
- Test reports for copper cable.
- Test reports for optical fibre cable.
- Fire services Flow rate design data is to be detailed in the O&M Manuals.

The O&M manual structure shall be determined at the outset of the project as detailed in the Project execution plan.

Hardcopy Requirements

No hardcopy of documents and drawings are required for all projects delivered via OmTrak. Where project works are undertaken on existing buildings utilising hardcopy O&M manuals, all new project works shall be delivered by OmTrak.

Warranties

In general, the principal, the University of Canterbury shall be named on the warranty.

Warranties are to be registered with manufacturers as necessary. Retain all copies of warranties delivered with components and equipment, collate and list all warranties in schedule in O&M manuals.

Commence warranty periods at practical completion or at acceptance of installation, if acceptance is not concurrent with practical completion.

If installation is not by manufacturer, and product warranty is conditional on the manufacturer's approval of the installer, submit the manufacturer's written approval of the installing firm.

A warranty schedule is to be provided in the O&M manual listing start date of warranty; warranty period; company who is providing warranty and phone number of warranty provider.

7.5.3 Asset Schedule

The Principal Contractor is required to provide to the University detailed information on all assets included in projects. As defined within the asset data section within the Project execution plan.

7.5.4 Mandatory Maintenance Schedules

Shall be detailed as per the project specification and included in the O&M manuals.

7.5.5 Commissioning and Testing

Detailed instruction in the operation of building automation, The University requires Inspection and Test Plans (ITP) for commissioning procedures associated with all services to demonstrate that the system operates in accordance with the Service Provider's design intent.

The format of ITPs to be used shall be agreed with the University of Canterbury Project Manager prior to preparation to enable the University to nominate certain procedures and project stages to be witnessed. These ITPs are to be submitted to the Project Manager at least 20 working days before commencement of testing.

Results of commissioning and testing shall be included in the O&M manuals together with the completed ITPs.

7.5.6 Provision of Training

Prior to Practical Completion, the Contractor and Specialist Subcontractors shall provide the services of competent personnel to instruct the appropriate University personnel in the operation and maintenance of the installed systems.

Detailed instruction in the operation of building automation, remote control or monitoring system and all microprocessor-based control functions shall be provided.

The Architect in consultation with UCPM shall arrange a training period of 5 days (subject to project complexity) for



7.5 Operations & Maintenance Manuals

comprehensive education and training of UC personnel in the use and operation of all installed plant and systems, including engineering services installation, communications/ IT etc. Video recording or training is required for review by the University.

The contractor shall allow for comprehensive staff training at two times during the contract period and for two different groups. Group one shall comprise of the tenants occupying the building and shall only need to attend the training 001 listed below. Group two shall comprise of the University personnel understanding the operation and use and shall attend two training sessions. These comprise:

- Two weeks prior to occupation of the space by the tenants.
- Two weeks prior to the issue of the Final Certificate. This requires the contract or to revisit the site at the end of the defects liability period to provide a second training session.

7.5.7 Facilities Management Staff Requiring Training

The components of the facility which require comprehensive staff training shall include, but are not necessarily limited to:

- Automatic doors
- Building Controls
- Card key access and security systems
- Communication services
- Electrical services
- Fire services
- Hydraulic services
- Lift & Escalators installation
- Master keying and locks
- Mechanical services
- Medical gas services
- Security services



7.6 BIM Requirements

Requirement for BIM projects only, all documentation and related files shall be created in line with the New Zealand BIM Handbook (current version at time of contract signing). Use of BIM shall be discussed on a case-by-case basis and shall (when used) follow the guidance presented here as well as within any project specific brief.

7.6.1 Project BIM Manager

Unless otherwise specified by the UCPM, the lead consultant shall be the Project BIM Manager. If required, the Project BIM Manager shall aid the UCPM in evaluating BIM capabilities, capacity and competency of possible consultants and contractors, pre-contract.

7.6.2 Project BIM Documents

At the onset of the project the Project BIM Manager shall produce a Project BIM Brief document in consultation with the UCPM and FMDO.

Following approval of the Project BIM Brief document by UCPM, the Project BIM Manager shall develop a Design BIM Execution Plan in consultation with the other design consultants.

Following approval of the Design BIM Execution Plan by UCPM, the Project BIM Manager shall develop a Construction BIM Execution Plan in conjunction with the Principle Contractor.

Following approval of the Construction BIM Execution Plan by UCPM, the Principle Contractor shall develop a FM/AM Plan in conjunction with the FMDO. Which shall schedule Data Capture (laser scanning by FMDO) of all or key services prior to wall and ceiling linings being fixed.

Documentation of Asset Capture shall be defined in the Project Execution Plan.

The Project BIM Documents shall remain 'live' and be actively maintained throughout the course of the project. The purpose of the Project BIM documents shall be, but not limited to:

- Define and communicate the University's BIM requirements for the project, identify desired outcomes, and the extent of utilisation (Design/ Construction/Operation).
- Provide a clear and concise scope of work for the project team, aiming to create a clear sense of direction and avoid variations, conflict, delays and confusion as the project progresses.
- Define a model element authoring schedule and a common data environment.
- Define the level of 3D modelling, 2D detailing, and scope of co-ordination of the documentation. The plan shall also clearly define the roles and responsibilities of the consultants and contractors involved in the work and the manner in which each shall use or contribute to the model.

7.6.3 Consultant Agreements

Consultant engagement and agreements shall be aligned with the Project BIM documents.

7.6.4 Project BIM Document Requirements

In addition to the general requirements listed above the Project BIM Documents shall provide specific guidance on the following items for each project:

- Procedures for model sharing/exchange
- Methods and responsibilities for clash detection and coordination.

- Communication methods - particularly regarding recording of requests for changes etc.
- Any members of the Design Team not participating in the modelling, and the implications of this.
- Naming conventions.
- Coordinates, grid setup, and element ownership
- Minimum requirement for all BIM deliverable is a LOD 300 construction model.
- Unless otherwise stated, where BIM deliverables are required to be LOD 500, geometry accuracy shall be to a tolerance of plus or minus 10mm.

7.6.5 Level of Development (LOD)

Unless specifically instructed otherwise, modelling requirements shall be defined by the Level of Development (LOD) definitions described in the **New Zealand BIM Handbook** (Appendix C) which shall be referred to for a full description of these definitions.

The Level of Development to be used in the modelling shall be clearly defined in the BIM Execution Plan - for each discipline and trade. For clarity these definitions are included in the table below:

LOD ###	Description of Model Content
LOD 100	The Model Element may be graphically represented in the Model with a symbol or other generic representation, but does not satisfy the requirements for LOD 200. Information related to the Model Element (i.e. cost per square metre, tonnage of HVAC, etc.) can be derived from other Model Elements.
LOD 200	The Model Element is graphically represented within the Model as a generic system, object or assembly with approximate quantities, size, shape, location and orientation. Non-graphic information may also be attached to the Model Element.
LOD 300	The Model Element is graphically represented within the Model as a design specified system, object or assembly in terms of quantity, size, shape, location, and orientation. Non-graphic information may also be attached to the Model Element.
LOD 400	The Model Element is graphically represented within the Model as a specific system, object or assembly in terms of size, shape, location, quantity, orientation with detailing, fabrication, assembly, and installation information. Non-graphic information may also be attached to the Model Element.
LOD 500	The Model Element is a field-verified representation in terms of size, shape, location, quantity, and orientation. Non-graphic information may also be attached to the Model Element.



Compliance Checklist

Project Name:	Date:
Submitting Consultant:	Design Stage:

Section 07 – Documentation Standards

Compliance Checklist

Complies
Does Not Comply
Not Applicable

Comments:

1.0 Section 01 – General

#	All Clauses	Complies	Does Not Comply	Not Applicable
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.0 Document Standards

#	All Clauses	Complies	Does Not Comply	Not Applicable	Comments:
		<input type="checkbox"/>			If ticked, 7.1.1 to 7.6.5 tick boxes are not required to be filled in.

7.1 Documentation Standards Overview

7.1.1	Purpose	Complies	Does Not Comply	Not Applicable
7.1.2	General	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.2 Project Milestone Deliverables

7.2.1	Resource Consent Issue	Complies	Does Not Comply	Not Applicable
7.2.2	Building Consent Issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2.3	Developed/Detailed Design 90% Issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2.4	Contract/Tender Issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2.5	First Construction Issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2.6	Final Construction Issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2.7	As-Built Issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.3 Deliverable File Naming

7.3.1	Document File Naming	Complies	Does Not Comply	Not Applicable
7.3.2	Drawing File Naming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3.3	File Naming Components	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3.4	Document Specific Naming Components	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3.5	Drawing Specific Naming Components	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.4 Deliverable File Content

7.4.1	Document Specific Requirements	Complies	Does Not Comply	Not Applicable
7.4.2	Drawing Specific Requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4.3	Working Drawing Title Block Requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4.4	Individual Working Drawing Requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4.5	File Type and Setup Requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4.6	Typical Drawing Requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4.7	As-Built Drawing Requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4.8	BMS As-Built Drawing Requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Compliance Checklist

Project Name:	Date:
Submitting Consultant:	Design Stage:

Section 07 – Documentation Standards

Compliance Checklist

Complies	Does Not Comply	Not Applicable	Comments:
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7.5	Operations & Maintenance Manuals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5.1	OmTrak System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5.2	Manual Content and Format	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5.3	Asset Schedule	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5.4	Mandatory Maintenance Schedules	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5.5	Commissioning and Testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5.6	Provision of Training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5.7	Facilities Management Staff Requiring Training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.6	BIM Requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6.1	Project BIM Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6.2	Project BIM Documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6.3	Consultant Agreements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6.4	Project BIM Documents Requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6.5	Level of Development (LOD)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Date:	<input type="checkbox"/> Acceptable
University Reviewer:	<input type="checkbox"/> Acceptable subject to comments
Signed:	<input type="checkbox"/> Resubmission required