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PARLIAMENT OF AUSTRALIA
DEPARTMENT OF PARLIAMENTARY SERVICES



DPS Standard for Project Documentation

DPS Drafting Standard
(for External contractors)

Version 3

OFFICIAL

DPS Drafting Standard (for External contractors)

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Abbreviations and acronyms

APH	Australian Parliament House and its grounds
BIM	Building Information Modelling
CAD	Computer Aided Design
.ctb	File extension for AutoCAD plot style table
.dgn	File extension for MicroStation drawing
.dgnlib	File extension for MicroStation library
DMS	Document management system
DPS	Department of Parliamentary Services
.dwg	File extension for AutoCAD drawing
.dwt	File extension for AutoCAD template
EPSDD	Environment, Planning and Sustainable Development Directorate
.ifc	File extension for platform neutral BIM files
OMM	Operation and Maintenance Manual(s)
.pdf	File extension for Adobe Portable Document Format file
.rvt	File extension for Autodesk Revit files
.tbl	File extension for MicroStation colour table
TIO	Technical Information Office

Definitions and Interpretation

- 1 For the purposes of this Standard:
 - (a) *APH Site Book* provides specific information to contractors about how contracts are to be performed on the Parliament House Site
 - (b) *As Constructed* refers to the comprehensive collection of documents and drawings that accurately records the works completed on site. Equivalent terms may include As-Built, Work-As-Executed or Work-As-Installed
 - (c) *Design documents* and/or *drawings* refers to documentation and drawings related to the design stage of a project i.e., 30%, 50%, 80%, For Tender
 - (d) *Drawing* includes plans, sketches, and layouts
 - (e) *Electronic format* refers to digital files stored on a multimedia storage device
 - (f) *Environment, Planning and Sustainable Development Directorate* refers to the directorate of the Australian Capital Territory (ACT) Government.
 - (g) *Equipment number* refers to both DPS SAP-PM Equipment number and the Plant Equipment (PE) number. The equipment number is the DPS SAP-PM assigned identifier and is also commonly referred to as the PE number. Equipment numbers are not re-assigned to different or replaced items of plant and equipment
 - (h) *External Contractor* means the person or entity bound to execute the work under a contract with DPS. The term ‘contractor’ also applies to subcontractors engaged to carry out work
 - (i) *Including* implies ‘including but not limited to’.

- (j) *Must* refers to a mandatory, non-discretionary action.
- (k) *Project Manager* refers to the person responsible for delivering the outcomes of the project and compliance with this Standard
- (l) *Room number* refers to the allocated identifier for a virtual and physical space and these room numbers appear on architectural drawings (e.g., 1C.1.004)
- (m) *Suite number* is an identification given to a room or collection of rooms used for a common purpose. Suite numbers may appear on architectural drawings (e.g., S1-21). On-site, the suite number is displayed as a plaque adjacent to the entry door
- (n) *Technical identifier* refers to a name or identification given to a component or piece of equipment by DPS. Technical identifiers may be re-assigned by DPS
- (o) *Technical Information Office* is the DPS office responsible for maintaining Australian Parliament House technical records.

Introduction

- 2 The DPS Standard has been prepared to assist contractors to produce CAD models, documentation and drawings to DPS standards.

Background and purpose

- 3 DPS is required to maintain and retain a complete and current set of drawings relating to the fabric and services of APH and the Parliamentary precincts.
- 4 The DPS Standard provides contractors and design consultants with a guide to producing CAD models and drawings for DPS to ensure their creation and amendment are consistent in style and quality.
- 5 Contractors and design consultants engaging subcontractors to carry out CAD documentation must include an obligation to comply with this Standard as part of the relevant contract and supply this Standard and CAD-related files provided by DPS to the subcontractor.

Scope

- 6 The DPS Standard:
 - (a) sets out the principles and best practices that apply when creating or amending drawings on behalf of DPS
 - (b) applies to design, construction, commissioning, operation, maintenance, and decommissioning of services within APH and the Parliamentary precincts, and
 - (c) provides guidance on the setup of MicroStation and AutoCAD applications for contractors.

Business risk identification

- 7 As Constructed drawings that display incorrect information can be hazardous to the health and safety of site visitors and personnel using the facility.

Software requirements

CAD applications

- 8 DPS uses the following CAD software:
 - (a) Bentley MicroStation as its primary CAD application

- (b) Autodesk AutoCAD as its secondary CAD application, and
 - (c) Autodesk Revit for 3D BIM modelling.
- 9 Variations in terminology between CAD applications will be clarified in this Standard. Where both MicroStation and AutoCAD terms are available, MicroStation terms are the preferred standard.
- 10 CAD models, documentation and drawings may be developed in other CAD applications. However, they must be submitted to DPS in either MicroStation .dgn format or AutoCAD .dwg format.
- 11 Where BIM has been used to develop any documents or drawings in relation to the project, the BIM files in .ifc or .rvt format must be included.
- 12 CAD data containing time sensitive or functionality limits, software licencing watermarks, passwords, or requirements to purchase additional applications or licences will not be accepted. See the section [Data ownership and copyright](#).

Software ownership

- 13 Contractors submitting drawings to DPS must provide DPS with sufficient intellectual property rights to facilitate the production, amendment, viewing, and publication of drawings and models to meet DPS' needs.
- 14 Contractors must provide satisfactory evidence of their intellectual property rights to DPS upon request in accordance with the timeframes as outlined in the contract, or if no timeframes are outlined, as soon as practicable after the request.

Project Setup

- 15 Localised setup for MicroStation:
- (a) extract the *APH_[Discipline] DGN Template [Date].zip* archive
 - (b) locate the files supplied in the *APH_[Discipline] DGN Template [Date]* folder
 - (c) save the files to the location that:
 - (i) best suits the contractor's local or network setup, and
 - (ii) fulfils the requirements of this Standard.
- 16 Localised setup for AutoCAD:
- (a) extract the *APH_[Discipline] DWG Template [Date].zip* archive
 - (b) locate the files supplied in the *APH_[Discipline] DWG Template [Date]* folder
 - (c) save the files to the location that:
 - (i) best suits the contractor's local or network setup, and
 - (ii) fulfils the requirements of this Standard.
- 17 Contractors should note that some IT Administrator privileges may be required to save the supplied files to the most efficient location, and they should contact their IT department to facilitate this.

CAD system variables

- 18 The system variables are set, where possible, in the drawing templates. The contractor must ensure their application(s) adhere to the following:

Measurement	Unit:	1
Master Unit	millimetres	mm
Length	Type: Precision:	Decimal (mm) 0 - Zero decimal places
Angle	Type: Precision: Direction:	Decimal Degrees 0.00 - Two decimal places Anti-Clockwise
Direction	Base Angle:	East 0.00°
Line Scale	Linestyle Scale Factor/Ltscale:	1

General drafting requirements

- 19 Unless stated otherwise in this Standard, drawings must be produced in accordance with AS1100 including its parts and amendments. See the section [Associated resources](#).
- 20 Drawings must:
- use the [Levels/Layers](#) and [Cells/Blocks](#) supplied in the discipline template(s)
 - be uniform, of good quality, clearly presented, logically sequenced, and created using best drafting practices
 - be sufficiently annotated and dimensioned, and
 - have the supplied title sheet present, as outlined in the section [Title Sheets](#) and completed with the appropriate titles and signatures.
- 21 Orthographic drawings must be prepared using the *AccuDraw/Orthomode* and *AccuSnap/Osnap* features to ensure true horizontal, vertical, perpendicular, and closed geometry.
- 22 Line diagram drawings must be prepared using the *AccuSnap/Snapmode* and *Gridlock/Gridmode* features, no smaller than 5mm, to ensure line work and symbols are neat, evenly spaced and not overcrowded.
- 23 Design drawings must be prepared to achieve a clear representation of design intent, constructability, operability and highlight any special requirements to ensure the end product is safe, ergonomic and fit for purpose.
- 24 As Constructed drawings must be prepared to achieve a clear and accurate representation of work completed on site, including its relationship to existing equipment and structures on site. See the section [Tying into existing services](#).
- 25 Drawings that do not comply with the requirements in this Standard will be rejected by the Project Manager. The contractor must then re-submit the rectified version to the Project Manager for further review.

Drawing templates

- 26 The CAD templates provided by the Project Manager, including the [Levels/Layers](#) systems and [Cells/Blocks](#) libraries of those templates, must form the basis of models and drawings regardless of the CAD application used by the contractor.
- 27 The MicroStation drawing templates .dgnlib contain level, line style, text, and dimension style definitions applicable to their disciplines.
- 28 The AutoCAD drawing templates .dwt contain layer, line type, text, and dimension style definitions applicable to their disciplines.
- 29 The APH template packages are as follows:

CAD Template	Zip File
APH_Architectural	APH_Architectural [DGN/DWG] Template [Date].zip
APH_BMS	APH_BMS [DGN/DWG] Template [Date].zip
APH_Communications	APH_Communications [DGN/DWG] Template [Date].zip
APH_Electrical	APH_Electrical [DGN/DWG] Template [Date].zip
APH_Fire	APH_Fire [DGN/DWG] Template [Date].zip
APH_Hydraulics	APH_Hydraulics [DGN/DWG] Template [Date].zip
APH_Irrigation	APH_Irrigation [DGN/DWG] Template [Date].zip
APH_Landscaping	APH_Landscape [DGN/DWG] Template [Date].zip
APH_Mechanical	APH_Mechanical [DGN/DWG] Template [Date].zip
APH_Security	APH_Security [DGN/DWG] Template [Date].zip

Drafting Standard checklist

- 30 A copy of the Drafting Standard checklist can be found in each discipline specific template provided by the Project Manager.
- 31 The draftsman must check each drawing against the relevant Drafting Standard checklist and sign the checklist to certify that the drawings comply with this Standard, prior to submission to the Project Manager.
- 32 The signed checklist may certify multiple drawings only:
 - (a) in a single discipline, and
 - (b) in a single submission.

Use of model space and paper space

- 33 In MicroStation:
 - (a) the *Design Model* must contain:
 - (i) the design data
 - (ii) annotations
 - (iii) leaders, and
 - (iv) dimensions.
 - (b) The *Sheet Model* must contain:

- (i) the APH title sheet (as a *Reference*), and
 - (ii) the title text
- 34 In AutoCAD:
- (a) the *Model Space* must contain:
 - (i) the design data
 - (ii) annotations
 - (iii) leaders, and
 - (iv) dimensions.
 - (b) The *Paper Space* must contain:
 - (i) the APH title sheet (as an *Xref*)
 - (ii) the title text, and
 - (iii) viewport(s).
- 35 *References/XRefs* must be *Merged/Bound* before submission to DPS, as outlined in the section [References/XRefs](#).

Axes and datums

General

- 36 Drawings containing architectural data must be set-out and dimensioned using gridlines related to the site axes.
- 37 APH is arranged functionally around two axes:
- (a) the north-south (Y-axis) known as the Land Axis, provides the centre line through the Parliamentary Triangle, Marble Foyer, Great Hall, Members Hall, and the Executive Wing, and
 - (b) the east-west (X-axis) known as the Parliamentary or Legislative Axis, provides the centre line through the two Parliamentary Chambers and the Members Hall.
- 38 The intersection of these axes is at the centre of the Members Hall and flag mast at Site Coordinates: X=500,000mm, Y=500,000mm.

Site north

- 39 The *site north* is located at 40° clockwise to *true north* and forms the basis of the north-south axis.

Scales

- 40 Geometry in the *Model space* environment must be drawn at 1:1 scale with the relevant scaled views and scale bars located in the *Sheet/Paper space* environment.
- 41 Scale factors are detailed in the table below. The scale selected for a drawing or view must be determined by considering the type of information being communicated, clarity of design intent, clarity of annotations, and economy of drawing production.
- 42 Where drawings contain multiple scales, the scale in the title sheet must be written “AS SHOWN” with the individual scales of each view written below each view title.

- 43 Where drawings do not conform to any scale, such as Piping and Instrumentation Diagrams, Process Flow Diagrams or Single Line Diagrams, the scale must be written as “*NTS*” in the title sheet or below the individual view title, as appropriate.
- 44 The following table shows the preferred scale factors:

Description	Scale	General Use
Enlargement Ratios	10:1 to 2:1	To clarify the detail of smaller items.
Actual Size	1:1	To highlight actual size.
Reduction Ratios	1:2 to 1:50	Component and construction details.
	1:50 to 1:200	General arrangement/Location drawings.
	1:200 to 1:1000	Site plans, Location/Block plans.
Multiple Scales	AS SHOWN	Actual scale to be shown under view title.
Not to Scale	NTS	To be shown on Title sheet and/or under view title.

Title sheets

- 45 Contractor Design and As Constructed drawings must contain an APH title sheet as a *Reference/XRef*, as shown in the table below:

Sheet	Size	Dimensions
APH_A1_L	A1	594 x 841mm
APH_A3_L	A3	297 x 420mm

Modifications to the title sheet

- 46 The title sheet *Reference/XRef* must not be resized, redrafted or in any way modified, other than to complete the text fields, position the location of works icon and show the correct North orientation (if applicable).

Views and Viewports

- 47 In MicroStation:
- ensure the design data is in line with the [Axes and datums](#) (if applicable)
 - under *References*, move the title sheet reference to encapsulate the geometry required
 - under *Models – Define Sheet Boundary*, move the sheet boundary to align with the title sheet, and
 - fence clip *References* (if applicable).
- 48 In AutoCAD:
- ensure the design data is in line with the [Axes and datums](#) (if applicable)
 - create a viewport on the viewport layer
 - open the viewport and move the view to encapsulate the geometry required, and
 - close and lock the viewport.

Drawing titles

- 49 In MicroStation, once the Title Sheet has been positioned correctly, the drawing titles must be copied into the 'live' drawing and completed by editing the text.
- 50 In AutoCAD, the drawing titles must be completed by editing the text.
- 51 All sections of the drawing titles must be completed in full.
- 52 Drawings with incomplete titles will be rejected by the Project Manager. The contractor must then re-submit the rectified version to the Project Manager for further review.
- 53 Drawings must include the *Area of work* icon to identify the location of the construction works within the Parliamentary precinct. The location must be indicated using the red hatched circle on the location plan supplied within the title sheet.
- 54 Plans must be oriented with *site north* towards the top, or to the left of the title sheet. The orientation is to be clarified by way of a north arrow on the primary view.
- 55 The variation between *site north* and *true north* must be indicated on drawings by way of the supplied location plan.

Drawing status

- 56 The following must be used on the title sheet status line:

Status	Details
30%	Preliminary/Sketch drawings for information.
50%	Preliminary/Sketch drawings for information.
80%	Design drawings for information.
FOR TENDER	Detailed design drawings issued for tender purposes.
FOR CONSTRUCTION	Final Design drawings for fabrication, construction and installation.
SHOP DRAWING	Project drawings supplied by the Fabricator
AS CONSTRUCTED	Drawings updated after construction on site is complete.

- 57 In the case of vendor drawings, the status is not recorded on the drawing but only in the DMS as follows:

Status	Details
VENDOR DRAWING	Proprietary drawings obtained from the manufacturer.

Contractor logos

- 58 The contractor logo:
- must only be inserted in the space provided on the APH title sheet for contractor logos
 - must not be added by modifying the APH title sheet *Reference/XRef* itself
 - should preferably be a constructed vector *Cell/Block*
 - may be a raster image, provided it is pasted into the CAD file and not referenced
 - text, if not modelled, must be a TrueType font, and
 - must be placed on the *Level/Layer* TBLOCKTEXT.

REVISION CHANGES	Rev.	By	Description	Date
	A	MB	FOR TENDER	14-04-19
CONTRACTOR DETAILS	PRINCIPAL - The Cable Guys Pty Ltd. CONSULTING ENGINEER - J. Bloggs & Co. FIRE ENGINEER - A. N. Other BCA CERTIFIER - ABC Certifiers Pty Ltd.			
AREA OF WORKS ICON				
LOGO OF CONTRACTOR OR CONSULTANT WHO DELIVERED THE PACKAGE	PARLIAMENT OF AUSTRALIA PARLIAMENT HOUSE CANBERRA			
AREA & FLOOR	Contractor 			
PROJECT TITLE	Project Title		Area	
	DPS BI OFFICE		3D BASEMENT	
DRAWING TITLES	Sheet Title AREA 3D BASEMENT DATA PANEL ROOM PLAN			
FIRST INITIAL WITH SURNAME IN FULL AS REQUIRED	Drawn	Date	Checked	Date
	A. Man	08-04-2019	N. Citizen	10-04-2019
	Certified	Date	Approved	Date
	J. Bloggs	12-04-2019	A. Nother	14-04-2019
SCALE	Status			Scale
	FOR TENDER			1:50@A1
CURRENT STATUS	Filename.	Drawing No.	Revision	
	CEW1234-COM001	CEW1234-COM001	A	
CURRENT REVISION				

Drawing numbering

59 DPS project drawing numbers are supplied by the Project Manager and are constructed using the format:

- ***(Prefix)(Project No.)-(Element No. [if applicable])-(Discipline)(3 figure Drawing Series No.)***

DPS Overall Project No.	Type	Prefix	Project No.	Separator	Element No. (if applicable)	Separator	Discipline Code	Drawing Series No.
AP1234-E001	Administrative Project	AP	1234			-	E	001
WM5678-M001	Works Management	WM	5678			-	M	001
WM5678-G1A-F001	Complex Works Management	WM	5678	-	G1A	-	F	001

Note: Not all projects will require an element number. When an element number is required, example G1A of the Element No. is broken up as follows:

- G denotes Group
- 1 denotes Stage
- A, B, C etc. denotes different main contractors to the project.

Numbering must include discipline codes from the table below

Other overall project numbers such as CR, DR, and DPS projects are supplied at time of contract and follow the same drawing numbering convention.

- 60 Each drawing must represent a **single discipline** and/or **sub-discipline**. Multi-discipline drawings are not permitted unless requested by DPS for the purposes of clash detection. For example, the Electrical discipline has sub-disciplines of lighting and power, and these must be separate drawings. Data information must be part of communication discipline drawings.
- 61 If there is an issue with the drawing numbering format, the contractor must immediately contact the Project Manager for clarification.

Discipline codes

62 The following discipline codes must be used:

Code	Discipline	Code	Discipline
A	Architectural	H	Hydraulic Services
BMS	Building Maintenance Services	I	Irrigation
C	Civil, Survey & Traffic	L	Landscaping & External Areas
COM	Communications	M	Mechanical Services (HVAC)
E	Electrical Services	MLF	Lifts
F	Fire Services	SEC	Security
FUR	Furniture & Joinery	S	Structural

File naming conventions

63 Contractor project drawings submitted to DPS must use the file naming convention matching the drawing number. Based on the examples above:

- AP1234-E001.dwg
- WM5678-M001.dwg
- WM5678-G2B-M001.dwg

- 64 The file name must not include any prefixes or suffixes denoting status or revision. Revision history will be kept in DPS' DMS.
- 65 The status of a drawing submission may be noted in an appropriately named Windows folder, zip file or transmission documentation.
- 66 The *Sequential Number* in file names must be prefixed with '0' (zero) or '00' as required to make 3 figures and ensure alpha-numerical order is maintained in all databases. For example:

Incorrect Numerical Order		Correct Numerical Order	
WM5678-G2B-M1.dwg	✘	WM5678-G2B-M001.dwg	✓
WM5678-G2B-M10.dwg	✘	WM5678-G2B-M002.dwg	✓
WM5678-G2B-M2.dwg	✘	WM5678-G2B-M010.dwg	✓
WM5678-G2B-M300.dwg	✘	WM5678-G2B-M040.dwg	✓
WM5678-G2B-M40.dwg	✘	WM5678-G2B-M300.dwg	✓

- 67 Each CAD file must:
- contain a single drawing, and
 - have an individual drawing number.
- 68 CAD files must not:
- have multiple drawings in the *Model space* environment, or
 - have multiple drawings tabulated in the *Sheet/Paper space* environment.
- 69 A drawing series spread over multiple sheets must have unique drawing numbers with a sheet number detailed in the drawing title. For example:
- SHEET 1 OF 2, and
 - SHEET 2 OF 2.

DPS room numbers and technical identifiers

- 70 Details of the requirements for DPS room numbers, DPS technical identifiers and SAP-PM equipment numbers are outlined in the [DPS Operation and Maintenance Manual\(s\) Template and Guidelines \(for External Contractors\)](#).
- 71 By the For Tender submission all plant and equipment, services information, and room locations must be correctly designated and shown on relevant drawings.

Cover Sheet

- 72 The first drawing of each discipline series (Cover Sheet) must:
- clearly show the Project Number, Project Title, and discipline
 - contain a drawing list
 - contain a Legend, and

(d) a section of General Notes, if applicable.

73 The Cover Sheet may expand to more than one drawing if required.

Request for Current Drawings

74 Contractors must:

- (a) request current Architectural and Service drawings from the DPS Project Manager, and
- (b) not reuse legacy drawings from previous projects.

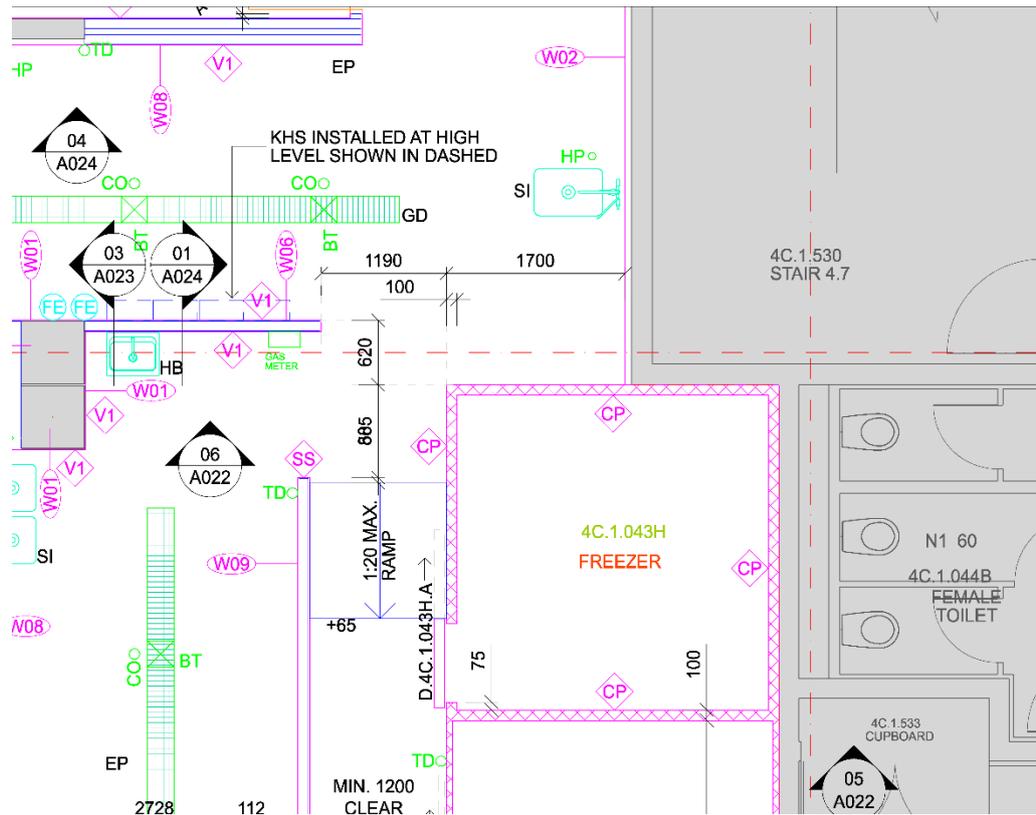
References/XRefs

75 All Contractor drawings must be coordinated and referenced across the latest drawing revisions specific to the project, prior to submission to DPS.

76 New work on Architectural and Services drawings must be depicted in colour.

77 All Existing elements on Architectural and Services drawings should be depicted in greyscale.

- (a) For the existing Architectural elements use MicroStation: 240 (RGB 85,85,85), AutoCAD: Colour 251 (RGB 101,101,101). The example below shows new architectural work in colour and existing architectural elements in greyscale.



- (b) For the existing Services use MicroStation: 112 (RGB 150,150,150), AutoCAD: Colour 253 (RGB 153,153,153). The example below shows new services in colour and the existing architectural elements and services in greyscale.



- 78 Yellow colour is not legible on printed hard copies and must not be used.
- 79 Drawings containing missing references, links, fonts, line styles, shape files or images will be rejected by the Project Manager. The contractor must then re-submit the rectified version to the Project Manager for further review.
- 80 *References/XRefs* may be used during the development of drawings, however they must be *Merged/Bound* without unnecessary information, hidden *Levels/Layers*, and geometry outside of the view area to be trimmed and deleted from the drawing, prior to submission to DPS.

Cross-references

- 81 Drawings containing cross-references to other drawings must use the *Cell/Block* markers indicating the drawing number and view identifier of the cross-reference.
- 82 If amendments are made to existing cross-references, the associated cross-referenced drawing(s) and view(s) must also be amended to reflect the amendment.

Attachments

- 83 Images, photographs, and spreadsheets must be copied and pasted directly into the drawing. Linked or referenced files are not permitted.

Levels and layers

- 84 DPS *Level/Layer* naming and configurations are governed by discipline, with a separate template for each discipline, as outlined in the section [Drawing templates](#).

- 85 DPS *Levels/Layers* must be sourced from the APH template files. Additional *Levels/Layers* may be created (and only if they cannot be sourced from APH template files) provided they are clearly and concisely named and do not use the DPS prefixes supplied in the templates (e.g., *Arch_*).
- 86 In the event a layer is created by the external contactor because it cannot be sourced from the APH template then each new layer must be named using the *New_* prefix.

Colours, styles, and weights

- 87 The line colours, styles, and weights for the MicroStation application are defined in the .dgnlib files, as outlined in the section [Drawing templates](#).
- 88 The line colours, styles and weights for the AutoCAD application are defined in the .dwt files, as outlined in the section [Drawing templates](#).

Plotting

- 89 The plot colour tables for the MicroStation and AutoCAD applications are *APH_Standard.tbl* and *APH Standard.ctb* respectively.

Geometry

- 90 Geometry must:
- be created on the appropriate *Level/Layer*
 - have properties set to *By Level/By Layer*, and
 - use *AccuSnap/Osnap* and *AccuDraw/Orthomode* where appropriate.
- 91 For clarity, the drawing's line scale factor may be modified to clearly display certain line styles at certain scales.

Text

- 92 Text must:
- be created on the appropriate *Level/Layer*, and
 - have properties set to *By Level/By Layer*.
- 93 Annotation text written over multiple lines must be in *Textnode/Multiline* format and must not be constructed from multiple instances of single line text.
- 94 Text must be written in upper case except for units, abbreviations, and signatures.

Example	Text
Millimetres	mm
Number	No.
Signature	J. Bloggs

Size

- 95 To ensure text is legible when printing to A3 reductions, the minimum height for text on A0 title sheets is 2.5mm. The minimum height for text on A1 title sheets is 1.75mm.
- 96 The general text width to height ratio is reduced as per this table:

Font Height	Font Width
1.75mm	1.65mm
2.50mm	2.40mm
3.50mm	3.40mm
5.00mm	4.90mm
7.00mm	6.90mm

Style

- 97 The font used for DPS drawings is TrueType 'Arial'.
- 98 The MicroStation font must be set to 'Arial'. The AutoCAD Text Style must be set to 'Standard' with the associated font set to 'Arial'.

Justification

- 99 The general justification for text is bottom left.
- 100 The positioning and justification of annotation should be in relation to the object it refers to. If the text is positioned:
- to the right of an object, it should be left justified
 - to the left of the object, it should be right justified, and
 - in the centre of the object, it should be centre justified.

Symbols

- 101 Within the text editors in MicroStation and AutoCAD, engineering symbols can be added to text using the Unicode input from the keyboard. For example:

Unicode	Result
90 (Alt+0176)	90°
(Alt+0216) 600	∅600

Cells and blocks

- 102 *Cells/Blocks* must be placed on the appropriate *Level/Layer* with its properties set to *By Level/By Layer*.
- 103 DPS *Cells/Blocks* must be inserted from the *Cell Library/Symbols Sheet* contained within the discipline zip file supplied.
- 104 Contractors may create *Cells/Blocks* that are not available in the *Cell Library/Symbols Sheet* provided that:
- symbolic *Cells/Blocks* must be:
 - created to Australian Standards where appropriate
 - clearly and concisely named
 - located on the appropriate *Level/Layer*
 - added to the Legend on the Cover Sheet drawing, and

- (b) graphical *Cells/Blocks* (e.g., a hand basin, a toilet, or a door) provided they are unmistakable, are not required to be added to the Legend drawing.

Hatching

105 Hatching must:

- (a) be created on the appropriate *Level/Layer* with its properties set to *By Level/By Layer*
- (b) have *Associative* activated
- (c) not overlap, and
- (d) be used sparingly, typically but not restricted to, sectional views.

106 *Dropping/Exploding* hatching is not permitted.

Dimensions and leaders

107 Dimensions and leaders must be created on the appropriate *Level/Layer* with its properties set to *by Level/By Layer*.

108 Dimension and leader styles for MicroStation and AutoCAD applications are defined in the .dgnlib and .dwt files, as outlined in the section [Drawing templates](#).

109 *Dropping/Exploding* dimensions or leaders is not permitted.

110 Text overrides are permitted to add detail to a dimension. For example:

- $\emptyset 600$
- 1000 Min.
- 'D' (See Table 1)

111 Dimensions must not be modified to falsely display the desired figure. The model must be amended to reflect the dimension required.

112 Where the model does not fit into the drawing sheet at the required scale, two or more split views should be used with break lines and jogged dimensions.

Tying into existing services

113 As Constructed drawings must detail, with dimensions, where and how:

- (a) new equipment is located, connected, and controlled in relation to existing equipment and structures
- (b) new pipe and conduit services:
 - (i) are connected to, and routed in relation to, existing pipe and conduit services, and
 - (ii) interface with or penetrate existing structures.

Approval initials and signatures

114 This section outlines the representatives responsible for the content of drawings.

Drawn

115 Drawings must be initialled by the draftsman.

Checked

- 116 Design drawings must be initialled by a person within the Design Agent's organisation who has the relevant professional and technical competencies for verifying the design output and checking the accuracy of the information.
- 117 As Constructed drawings must be initialled by a person within (or engaged by) the contractor's organisation that has the relevant professional and technical competencies for checking the accuracy of the information.

Certified

- 118 Design drawings must be signed by a Manager within the Design Agent's organisation who has the relevant professional and technical qualifications for verifying the design output and certifying the accuracy of the information.
- 119 As Constructed drawings must be signed by a manager within (or engaged by) the Design Agent's organisation that has the relevant professional and technical qualifications for certifying the accuracy of the information.

Approved

- 120 Design drawings must be signed by the Project Manager responsible for the work, certifying that the drawings may be used for tender and/or construction purposes.
- 121 Shop drawings must be signed by the Design Agent, approving the drawing for use.
- 122 As Constructed drawings must be signed by the Project Manager responsible for the work to certify the approval.

Dates

- 123 Dates must be written in the format: DD/MM/YYYY.

Revisions

Clouds and triangles

- 124 Revision clouds and triangles must be used during the Design, Tender and For Construction submissions to highlight design changes between revisions.
- 125 Revision clouds and triangles must be removed at As Constructed, prior to submission to DPS.

Tables

- 126 Revision table entries must be in alpha-numerical order. In cases where the number of revisions exceed the rows provided, older revisions may be removed, provided those revisions have been submitted to DPS previously.
- 127 The revision description must briefly list the changes to the drawing, unless the only change is to the status, simply reiterate the drawing status, or as outlined in the section [Drawing Status](#).
- 128 The revision details must state:
- (a) revision letter/number
 - (b) drafter's initials
 - (c) brief description of change/status change, and
 - (d) date in the format: DD/MM/YY.

File accessibility

- 129 The contractor must ensure all files are free from computer viruses and are not password protected prior to submission to DPS. To ensure compliance this requires contractors to check subcontractor files.

Transmittals

- 130 Project drawings submitted to the Project Manager must be accompanied by a transmittal.
- 131 The transmittal must include:
- (a) the DPS project number and project title
 - (b) the contractor's name and contact details
 - (c) the date
 - (d) details of what drawings are being transmitted, and
 - (e) the status and revision number of each drawing.

Stakeholder and drafting reviews

- 132 The contractor must submit drawings (including original format CAD drawings) in electronic format to the Project Manager for a Stakeholder design and drafting review, as outlined in the submissions below.
- 133 Following the Stakeholder and drafting review, the Project Manager will supply the contractor with a collated list of any defects and/or requests for further information, if required.

Project planning/design phase

Submissions

- 134 Where separate drawings are supplied to the contractor by a third party, it is the contractor's responsibility to collate that information so that it can be read as one cohesive package.
- 135 Subcontractor drawings must comply with this Standard.
- 136 This section details the requirements for the provision of project documentation according to the signed contract with DPS. Documents and drawings must be submitted by the contractor for the following project stages and as required by the signed contract:

Design stage

- 137 The first Design submission must be prior to the For Tender stage.
- 138 The 30%, 50%, 80% drawings requirements of the project include:
- (a) preliminary/sketch drawings
 - (b) design drawings, and/or
 - (c) developed drawings.
- 139 The contractor must supply:
- (a) a CAD set of the drawings, in .dgn or .dwg format, per discipline (per sub-project if applicable), and
 - (b) a .pdf set of the same drawings

- (c) where BIM has been used to develop any documents or drawings in relation to the project, the BIM files in .ifc or .rvt format must be included.

For Tender

140 The For Tender drawing requirements of the project include:

- (a) detailed design drawings complete with sections and details sufficient for the calling of tenders, including as appropriate, coordination and integration of subcontractor's work
- (b) detailed design drawings including details of the equipment and fittings requiring bespoke fabrication and/or specialised installation, and
- (c) detailed design drawings including details of the plant, equipment and fittings that must be removed or decommissioned.

141 The contractor must supply:

- (a) a CAD set of the drawings, in .dgn or .dwg format, per discipline (per sub-project if applicable), and
- (b) a .pdf set of the same drawings
- (c) where BIM has been used to develop any documents or drawings in relation to the project, the BIM files in .ifc or .rvt format must be included.

Project delivery phase

For Construction

142 The For Construction drawing requirements of the project include:

- (a) final design drawings complete with sections and details sufficient for the calling of tenders, including as appropriate, coordination and integration of subcontractor's work
- (b) final design drawings including details of the equipment and fittings requiring bespoke fabrication and/or specialised installation, and
- (c) final design drawings including details of the plant, equipment and fittings that must be removed or decommissioned
- (d) where BIM has been used to develop any documents or drawings in relation to the project, the BIM files in .ifc or .rvt format must be included.

143 The contractor must supply:

- (a) a CAD set of the drawings, in .dgn or .dwg format, per discipline (per sub-project if applicable), and
- (b) a .pdf set of the same drawings
- (c) where BIM has been used to develop any documents or drawings in relation to the project, the BIM files in .ifc or .rvt format must be included.

Draft As Constructed

144 The first submission of Draft As Constructed drawings is received by the Project Manager for review purposes only.

- 145 Drawings contained in the draft submission that do not comply with this Standard will be rejected by the Project Manager. The contractor must then re-submit the rectified version to the Project Manager for further review.
- 146 The contractor must supply:
- (a) a CAD set of the drawings, in .dgn or .dwg format, per discipline (per sub-project if applicable), and
 - (b) a .pdf set of the same drawings
 - (c) where BIM has been used to develop any documents or drawings in relation to the project, the BIM files in .ifc or .rvt format must be included.
- 147 A digital PDF set of As Constructed drawings must be included in each OMM to form a complete record of the project for review purposes. The drawing title blocks must be completed and signed by the contractor, certifying that the information shown on the drawings is an accurate record of the As Constructed status.
- 148 The Project Manager will liaise with DPS Stakeholders to review the draft As Constructed submission and supply the contractor with a collated list of defects and/or requests for further information, if required.

Final As Constructed

- 149 Once DPS has accepted the draft As Constructed submission, the contractor must submit the final As Constructed drawings to the Project Manager within the agreed timeframe.
- 150 The final updated As Constructed drawings must include all rectified items identified in the DPS Stakeholders review of the draft submission. All drawings must be in CAD (.dgn or .dwg) and .pdf format and submitted within the agreed timeframe
- 151 A digital PDF set of As Constructed drawings must be included in each OMM to form a complete record of the project. The drawing title blocks must be completed and signed by the contractor, certifying that the information shown on the drawings is an accurate record of the As Constructed status.
- 152 The Project Manager will conduct a final cross-check of the final submission to ensure items identified for rectification have been incorporated.
- 153 If items have not been addressed in their entirety, the Project Manager will organise a meeting with the contractor and the relevant DPS Stakeholders involved in the review to resolve any outstanding issues.
- 154 Items that are identified as still requiring rectification will be referred to the contractor. The contractor must address these issues in their final resubmission.

Practical Completion

- 155 This section details the requirements for the provision of project drawings that must be submitted to the Project Manager at the completion of construction on site.
- 156 Drawings must accurately record the As Constructed details, identifiers and location of building elements, plant and equipment related to the project.
- 157 The As Constructed drawings required for the project must include:
- (a) DPS numbering convention and sitemap identification
 - (b) a drawing schedule listing every drawing for each discipline

- (c) plans, elevations, sections, and details
- (d) shop/assembly drawings of major plant and equipment (with appropriate dimensioning to identify elements and locations)
- (e) detailed engineering drawings for manufactured items
- (f) circuit/wiring diagrams for electrical installations
- (g) control and logic diagrams for electrical, electronic, pneumatic, and hydraulic control systems
- (h) a comprehensive legend representing items and attributes of each drawing, and
- (i) drawings dimensioned to show details of the fabrication and installation of services and equipment, including the relationship to building structure and other services, cable/pipe work type and size, and marking details
- (j) any other information that is used to supplement drawings (e.g., door, wall, and window schedules).

158 Where BIM has been used to develop any documents or drawings in relation to the project, the BIM files in .ifc or .rvt format must be included.

Obsolescence

159 If an individual drawing is made or becomes obsolete, it must be clearly watermarked or stamped with the word '*OBSOLETE*' in bold capital letters, signed by the contractor certifying its obsolescence and submitted to the Project Manager.

160 Obsolete drawings will be stored in DPS' DMS; therefore, the drawing number of an obsolete drawing must not be reused on another drawing.

161 If the project is suspended or cancelled, the contractor must submit a complete set of the most current CAD files in .dgn or .dwg format to DPS, regardless of their status in accordance with the contract conditions. All BIM documents or drawings in relation to the project must also be included.

Data ownership and copyright

162 The contractor must comply with copyright and data ownership requirements as outlined in the contract.

DPS drawings

163 The information contained within DPS drawings, models, documents, calculations, information, instructions and associated electronic files must not be copied or used for any purpose without the written permission of DPS.

164 Regarding gifted assets, the contractor must ensure that DPS is entitled to have free use and ownership of Design and As Constructed drawings and models it has submitted for a project.

Shop drawings

165 The information contained within Shop drawings, models, documents, calculations, information, instructions and associated electronic files must not be copied or used for any purpose without the written permission of DPS.

166 Shop drawings must:

- (a) conform to the requirements of this Standard and conditions stipulated in the applicable contract, and
- (b) be submitted to DPS for approval prior to the commencement of materials being ordered, fabricated and/or assembled.

Vendor drawings

- 167 Vendor drawings must comply with this Standard as far as possible, except to the extent that to do so would breach intellectual property rights held in those drawings.
- 168 The contractor must ensure that DPS has sufficient intellectual property rights to store, copy and use vendor drawings, models, maps, documents, calculations, information, and instructions for its own internal use as it requires.

Cadastre

- 169 Cadastral information supplied by the EPSDD remains the property of the ACT Government and must not be copied or used externally without the written permission of the EPSDD.

Associated resources

170 DPS:

- [DPS Operation and Maintenance Manuals Template and Guidelines \(for External Contractors\)](#)

171 Australian Standards:

- AS 1100.101 to AS/NZS 1100.501 - Technical Drawing (*plus Amendments*)

Feedback

172 To assist DPS to maintain a workable Standard, DPS appreciates and values any feedback from users of this Standard. Please provide written feedback to DPS Project Manager.