

Computer Aided Drafting (CAD)

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1. Purpose

The purpose of this Specification is to achieve consistency in the drafting content presented on the drawings and standardise the drawing submission process

2. Scope

This document details the Computer Aided Design (CAD) specifications and minimum requirements for all drawings prepared for Sydney Water ensuring adequacy and consistency creating and maintaining projects in the 2D.

Where there is ambiguity, discrepancy or inconsistency between this document and the drafting requirements set out in relevant Sydney Water editions of the WSAA codes, this document must be followed.

This document and attachments are available on the Sydney Water website.

3. General Requirements

All drawings prepared for Sydney Water shall be in AutoCAD drawing file format. Prior to submission of any DWG files to Sydney Water, the designer shall ensure that all drawings are prepared in the latest CAD release (unless requested otherwise). AutoCAD methodology and practice shall conform to this document.

All drawings shall be prepared as A1 size drawings using the relevant AutoCAD drawing template files (Electronic Attachments 1 and 2) available on the Sydney Water website. ***The "readme" document stored with the template files shall be read and acted upon prior to using the templates.*** Refer to "Notes on electronic attachments" in Clause 14.

Drawings containing external references shall be considered as working drawings only and will not be accepted as final drawings. Prior to submission of final drawings to Sydney Water, all external references, imported images etc. must be bound to individual drawings. ***Drawings containing unbound external references, imported images etc. will not be accepted.*** (See Clause 7.10).

All abbreviations and units shall be in accordance with AS 1000. Dimensions shall be in metric units. All levels shall be in metres to Australian Height Datum. The title block information shall be entered in accordance with Clause 7.7.

Subject to the approval of Sydney Water, equipment manufacturer's drawings and other similar type third party drawings may be considered exempt from Clause 7 of this document. However, the Sydney Water Contract name, Sydney Water Contract number and a drawing number as per Clause 6 must be added to the drawings in a prominent position near the bottom right-hand corner of the drawing sheet.

Any electronic drawing files provided to the designer by Sydney Water for use in preparation of the design and/or Work As Constructed (WAC) drawings shall remain the copyrighted property of Sydney Water and shall not be used for any purpose other than to assist in the preparation of the design and/or WAC drawings for the project(s) under contract.

Where the plotted drawing uses coloured line work, the colours selected shall be such that the line work depicted is clearly legible when the drawing is printed or copied on a monochrome (black and white) printer or copier in A3 size.

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Unless varied by the contract documents, all drawings prepared for Sydney Water shall conform to the requirements of this document. **The designer shall modify noncompliant drawings at his own cost.**

4. Drawing Template Files

The following standard drawing template files shall be used for the preparation of drawings prepared by designers:

- Gen_A1_drg_template.dwt (Electronic Attachment 1)
- Elec AI_drg_template.dwt (Electronic Attachment 2)

The standard drawing template files contain layer definitions, text and dimension style definitions and the standard drawing sheet frame and title block.

The drawing frame shall not be renamed or "Exploded". The title block contains variable fields, defined using AutoCAD "Attributes" for information input. The fields shall be completed as per Clause 7.7 of this document.

The designer's full company name, address, ABN number, telephone number, fax number, e-mail address and Sydney Water consultant contract number shall be added to the title block in the area designated in Appendix 3, "Sample Title Block Layout". The designer may add additional data boxes to their section of the title block if so desired.

5. EDMS

The Engineering Drawings Management System (EDMS) is used to manage and store WAC and provides easy management of all Sydney Water WAC drawings in one central application that is always accessible.

EDMS has four different interfaces.

- EDMS Power Web – require to be on Sydney Water Network
- EDMS Explorer Web– require to be on Sydney Water Network
- EDMS Internal Contractor Portal, commonly known as iOCP– require to be on Sydney Water Network

EDMS External Contractor Portal, commonly known as eOCP – does **NOT** require to be on Sydney Water Network Contractors will use the eOCP in order to:

- Request new drawing numbers
- Access to the drawings in their Project
- Download drawings assigned to their project
- Upload drawings to their allocated projects

6. Drawing Numbers

6.1 Numbering System

The drawing number consists of two parts. Both lines are either an alpha/numeric or numeric text string.

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The designer shall obtain the drawing numbers via accessing the EDMS Contractor Portal.

The CAD file name and drawing numbers issued by EDMS shall not be changed under any circumstances

6.2 Allocation of drawing numbers

Drawing numbers shall be obtained by accessing EDMS as indicated in Clause 6.1 above.

The designer must obtain drawing numbers **prior to commencing drafting work** in order to avoid back drafting and the resultant possibility of cross-referencing errors.

The drawing numbers issued by Sydney Water EDMS shall be strictly adhered to. No variation shall be accepted.

6.3 Drawing File Name

The format of naming drawing files shall conform to that as specified by Sydney Water's EDMS.

The drawing file naming convention shall be strictly adhered to. No variation shall be accepted.

7. Drawing File Specification

7.1 Drawing Environment

All drawings shall utilise the "paper space/model space" feature of AutoCAD. Under this environment, all structures and details must be created in "model space" at a scale of one to one (ie. in millimetres) and displayed in "paper space" using suitably scaled AutoCAD "Viewports".

Where the "paper space/model space" feature of AutoCAD is utilised, the dimensions, labels and annotation text associated with the details drawn, shall be scaled to suit and inserted in model space. However, the drawing frame, general notes, reference drawing list, material list, pipework schedule and other general notation shall be inserted as "paper space" entities (created in Mtext format) at a scale of one to one on the drawing layout.

In order to ensure AutoCAD references metric line types, pattern hatches, etc. the AutoCAD system variable "Measurement" shall be set to "1".

All linear reticulation infrastructure plans shall be projected in MGA.

7.2 Sydney Water standard CAD templates

The standard drawing template file issued by EDMS must be used for the preparation of new drawings prepared by designers:

Template files can also be downloaded from EDMS after the new drawing number has been issued:

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The standard drawing template files contain layer definitions, text and dimension style definitions and the standard drawing sheet frame and title block.

The drawing frame must not be renamed or “Exploded”. The title block contains variable fields, defined using AutoCAD “Attributes” for information input. The fields must be completed as per Clause 11 of this document.

The designer’s full company name, address, ABN number, telephone number, e-mail address and Sydney Water consultant contract number must be added to the title block in the area designated in Appendix 3, “Sample Title Block Layout”. The designer may add additional data boxes to their section of the title block if so desired.

7.3 Text Styles

Excluding measurement unit designations, all text shall be in uppercase. For general usage, the text style shall be AutoCAD ISOCP. The text style shall be defined as follows:

Style name	ISOCP
Font name	ISOCP.shx
Height	0
Width Factor	1.0
Obliquing Angle	0
Backwards	N
Upside - down	N
Vertical	N

It is recognised that occasions may arise where it is necessary to use other fonts. The practice will only be accepted when the desired result cannot be achieved using the ISOCP font. Where a substitute text font is used, the font shall be a standard AutoCAD text font and the associated text style name shall match the font name.

Text height, line weight and typical usage for drawing annotation shall be as follows:

Text Height	Line Weight	Typical Usage
3mm	0.35mm	General notes, labels, materials list, dimensions, etc
5mm	0.5mm	Minor view and section titles, minor headings etc
7mm	0.7mm	Major view and section titles, Major headings etc

7.4 Dimensioning Style

Dimensioning style shall be in accordance with Australian Standard AS 1100 and HB7: Engineering Drawing Handbook issued by Standards Australia.

The AutoCAD dimension style used shall be "Swstd" as defined in the standard drawing template files (Electronic Attachments 1 and 2).

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Each dimension shall be a single AutoCAD entity. "Exploded" dimensions are not acceptable.

7.5 Line Types

The layering convention for line types shall be as per Appendices 1, 2 and shall be set using the AutoCAD "Linetype" property to "Bylayer".

Drawings supplied utilising the AutoCAD "paper space/model space" feature shall have the AutoCAD system variables "Ltscale" and "Psltscale" set to "1 ". Electrical schematics, process and instrumentation drawings and other similar unscaled drawings which are supplied not using this feature shall have the AutoCAD system variable "Ltscale" set to match the scale of the drawing form.

For general drafting work, the following line types as defined in the supplied supplementary line type definition file "Line_types.lin" (Electronic Attachment 3) shall be used:

AS1100 Designating Letter	Line Type	Typical Usage
E	Dash_1	Hidden outlines and edges
G	Chain_1	Centre-lines and axes of solids, path lines for indicating movement, features in front of cutting plane, etc
K	Chdbdash	Outlines of adjacent parts, Alternative and extreme position of movable parts, etc
-	Inst_line	Instrument lines in process and instrumentation diagrams
-	Reodash	Steel reinforcing mesh in section

Any customized line types, developed by the designer and used in the preparation of Sydney Water drawings, must be defined for use in metric drawings. (i.e. Line types designed for imperial drawings shall not be scaled to suit metric drawings)

7.6 Entity colour and line weights

The method of setting a drawing entity's colour and line weight, and hence the entity's plotted pen thickness, shall be to set the AutoCAD entity "Color" and "Lineweight" properties to "Bylayer" and AutoCAD entity "Plot style" property to "Bycolor".

For all drawings (except electrical), the following colours shall be used to represent the various line weights or pen thicknesses for full size prints:

AutoCAD Colour No.	Colour	Line Weight
1	Red	0.5mm
2	Yellow	0.35mm
3	Cyan	1.4mm
4	Green	2.0mm
5	Blue	0.7mm
6	Magenta	1.0mm
7	White	0.25mm
8	Light Grey	0.18mm

The colours cyan, green and magenta shall only be used where extra line thickness is required for emphasis.

For electrical drawings the following colours shall be used to represent the various pen weights or thicknesses for full size prints:

AutoCAD Colour No.	Colour	Line Weight
1	Red	0.5mm
2	Yellow	0.35mm
3	Cyan	0.25mm
4	Green	0.25mm
5	Blue	0.7mm
6	Magenta	0.25mm
7	White	0.25mm
8	Light Grey	0.18mm

The AutoCAD plot style tables provided in Electronic Attachments 4 to 7 shall be used to ensure compliance with the above.

7.7 Layering Structure

The standard layering convention shown in Appendix 1 shall be used for the preparation of all drawings (except electrical). The standard layering convention shown in Appendix 2 shall be used for electrical drawings.

It is recognised that the use of numeric fixed layer names, as required by the standard layering conventions, may not be feasible when drawings are generated by some third party design packages. When this is the case, the appropriate standard layer number should prefix the layer name generated by the design package. For example, a layer

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generated by the design package named "pipe-dn450-123", which contains entities to be shown in 0.35 pen and dashed line, would be renamed to "51-pipe-dn450-123".

7.8 Title Block Information

The following should be read in conjunction with Appendix 3, "Sample Title Block Layout".

The designer shall complete the standard title block for all design drawings as follows:

- a) The drawing title shall include the work package or product/facility name and designation numbers and shall accurately describe the content of the drawing. AutoCAD attributes have been defined for four-line drawing title.
- b) Title 1 is the level 30 in Maximo location hierarchy for relevant product – This is valid for both linear and facility.

Title 2 for linear Assets – Water & Recycle water Name of trunk,
Wastewater Name of branch or trunk
Retic: Reticulation Water Main

Title 2 for Facility Assets - Facility Number and the address

- c) The first initial, full surname and company name shall be inserted into the appropriate fields in the "Designed" and "Drawn" signature boxes. The dates the drawing was designed and drawn shall be inserted in the appropriate fields.
- d) The first initial, full surname, company name of the designer's engineer or representative who has verified the drawing and who takes professional responsibility for the drawing content shall be inserted into the appropriate fields in the "Verified" signature box. The date the drawing was verified shall be inserted in the appropriate field.
- e) The first initial, full surname, company name of the designer's representative who approved the drawing for release to Sydney Water shall be inserted into the appropriate fields in the "Approved" signature box. The date the drawing was approved shall be inserted in the appropriate field.
- f) The first initial, full surname, position title of the Sydney Water representative who has recommended the acceptance of the drawing content shall be inserted into the appropriate fields in the "Recommended" signature box (where applicable). The date the drawing was recommended shall be inserted in the appropriate field. **These fields shall not be filled in until instructed to do so by Sydney Water.**
- g) The first initial, full surname, position title of the Sydney Water representative who has accepted the drawing content shall be inserted into the appropriate fields in the "Accepted" signature box. The date the drawing was accepted shall be inserted in the appropriate field. **These fields shall not be filled in until instructed to do so by Sydney Water.**
- h) If the drawing to be produced supersedes another, a box has been provided above the "Recommended" box for the purpose of inserting the superseded drawing number. If the drawing does not supersede another, a dashed line shall be placed in the box provided.
- i) Where known, the Sydney Water Project Number for the works depicted in the drawing shall be added in the appropriate box.
- j) The drawing index and plan numbers as defined in Clause 6 above shall be inserted in the appropriate fields.
- k) Where required, a sheet number for the works depicted shall be inserted in the appropriate field. If this box is not used, a dashed line shall be placed in the box provided.

7.9 Revision

- a) The title block "Revision Type" field shall be set to either "Draft" or "Issue". Prior to acceptance of the drawing by Sydney Water, the field shall be set to "Draft" and after acceptance "Issue" (unless directed otherwise).
- b) The title block "Revision" field shall be set as follows:
 - Prior to acceptance by Sydney Water, a drawing shall have a Draft number starting at 1. Subsequent draft revisions of drawing shall use the next consecutive number.
 - For the first issue of the accepted drawing the field shall be set to "A" (unless directed otherwise). Subsequent amendments to the drawing shall use the next consecutive alphabetical character.
- c) A field is provided to describe the current status of the drawing. The "Status Descriptor" field should reflect the current design phase of the drawing (eg. "Concept", "Draft", "Final", "Work As Constructed" etc.).

7.10 Amendments

Any amendments shall be completed as follows:

- a) The "details of amendments" list shall be left blank for the first draft and first issue.
- b) For each draft submitted after the first draft the draft number, description of modifications to the drawing, initials of the designer's engineer or representative who has approved the modifications to the drawing and who takes professional responsibility for the modifications, and the date are to be inserted.
- c) After Sydney Water has accepted the drawing any draft references are to be erased and the amendment list shall be left blank.
- d) For each amendment submitted after the first issue, the issue letter, a description of modifications to the drawing, initials of the designer's engineer or representative who has approved the modifications to the drawing and who takes professional responsibility for the modifications, and the date are to be inserted.

7.11 Use of external reference files

Externally referenced files promote coordination among different disciplines by making drawing information available simultaneously to different users. To assist in drawing preparation, where a major element within a project appears on more than one drawing, it may be drawn in a file that is attached to each drawing using the AutoCAD "Xref" command.

Drawings containing external references shall be considered as working drawings only and will not be accepted as final drawings. Prior to submission of final drawings to Sydney Water, all external references must be bound to individual drawings. **Drawings containing unbound external references, images etc. will not be accepted.**

7.12 Use of multiple sheet layouts

The "paper space / model space" feature of AutoCAD enables the user to define multiple page "layouts" referencing the one "model". Each "layout" represents a separate drawing. This feature is often used when preparing drawings of similar discipline of facility (eg. steelwork, pipework, etc.).

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Drawing files containing multiple "layouts" shall be considered as working drawings only and will not be accepted as final drawings.

Prior to submission of final drawings to Sydney Water for archiving, all drawing files containing multiple "layouts" shall be divided into separate AutoCAD drawing files. Each AutoCAD drawing file shall contain only one AutoCAD drawing sheet "Layout".

8. Modifications To Drawings

When draft or final drawings are modified the title block "Revision" field and amendment list are to be updated as per Clauses 7.9 a) b) and c). Amendment triangle/s or diamond/s, containing the draft number or issue letter, shall be placed adjacent to the modified section/s of the drawing. For additional clarity, revision cloud/s may also be used to highlight the modifications. Any revision clouds, amendment triangle/s or diamond/s used to highlight previous modifications shall be removed.

Preparation of "Work-as-Constructed" drawings are detailed in Clause 11.

9. Clean-Up of Completed Drawings

Prior to submission of final drawings to Sydney Water for archiving, all drawing files shall be edited to remove all entities which are not part of the final design. Details used in the development of the drawing, but which are not part of the final design shall be removed. All drawings shall also be purged to remove all irrelevant blocks, layers, text styles, etc through use of the AutoCAD "Purge" command.

The final drawings shall also be checked for database errors using the AutoCAD "Audit" command and any encryption or passwords removed

10. Supply Of Design Drawings

Drawings shall not be issued by the designer without a unique Drawing Number as per Clause 6.1, and either a Draft number or Issue letter.

Unless stipulated otherwise in the contract documents, all draft design drawings submitted to Sydney Water for review shall be supplied in Adobe PDF electronic format. The AutoCAD files of the drawings may also be requested to confirm that the drawings have been prepared in compliance with this document.

Unless stipulated otherwise in the contract documents, all final design drawings and any subsequent amendments of the drawings, submitted to Sydney Water shall be supplied electronically in both AutoCAD DWG (to the latest CAD release, unless requested otherwise) and Adobe PDF formats. Refer to contract documents for number of hard copy prints (if any) required.

11. Supply Of Work As Constructed Drawings

All Work-As-Constructed (WAC) drawings shall accurately reflect the works as constructed and installed.

Preparation of WAC drawings shall conform to the following:

- a) The AutoCAD files used, as the basis for preparation of all WAC drawings, shall be the final issue of the design drawings.
- b) A dated electronic certificate in the form of an AutoCAD "Block" shall be added to each drawing. As a minimum, the certificate shall be headed "Work-As Constructed", give the date the work was completed, the constructor's / installer's company name, the name of the constructor's / installer's representative, the name of the Sydney Water representative and the Sydney Water Contract number (if applicable)
- c) In the drawing title block, the drawing "Issue" letter of each drawing shall be changed to the next available letter
- d) In the drawing title block, the "Drawing Status" field shall be set to "Work As Constructed".
- e) An entry with the "Description" stating "Work As Constructed" shall be added to the drawing amendment list of each drawing. Where major deviations from the final design drawings have been made, the description shall also briefly describe or list the modifications made.
- f) Each drawing shall be modified wherever changes to the final detail design have been made. Amendment triangle/s or diamond/s, containing the issue letter, shall be placed adjacent to the modified section/s of the drawing. For additional clarity, revision cloud/s may also be used to highlight the modifications. Any revision clouds, amendment triangle/s or diamond/s used to highlight previous modifications shall be removed.
- g) Any additional drawings or sketches prepared by the constructor / installer to detail WAC information shall conform to this document. The new sketch or drawing will require a drawing number issued by the Sydney Water's EDMS in accordance with Clause 6.1 and shall be referenced as necessary to the relevant parent drawings.

12. Support Documentation

Documentation & supporting files to be submitted for equipment manufacturer's drawings and other similar type third party drawings, which Sydney Water has approved for exemption from Clause 7 of this document, shall include, but is not limited to, non-Sydney Water AutoCAD plot style table files (if used) and a comprehensive list of layers displayed for plotting purposes.

No material shall be submitted that may infringe copyright. Such files and any associated software shall not be used in the preparation of the drawing.

13. Appendices

- Appendix 1: Layering convention for CAD drawings (excluding electrical)
- Appendix 2: Layering convention for CAD drawings (electrical)
- Appendix 3: Sample title block layout

14. Definitions

Term	Definition	Source
EDMS	Engineering Drawing Management System	
eOCP	External EDMS Contractor Portal	
iOCP	Internal EDMS Contractor Portal	

15. Context

15.1 Accountabilities

Position	Accountabilities
Manager Asset Data Governance	<ul style="list-style-type: none"> Ownership and authorisation of document
Information Specialist	<ul style="list-style-type: none"> Review, implement and monitor compliance

15.2 Training and competencies

[Enter text]

Position	Training or competency
[Enter text]	[Enter text]
[Enter text]	[Enter text (and further rows as needed)]

15.3 References

Unless specified otherwise by this document, drawing practice shall conform to the current relevant Australian Standards including those as listed below:

Document type	Title
Compliance obligations	AS 1000 - The International System of Units (SI) and its application
	AS 1100 - Technical Drawing
	AS 1101 - Graphic Symbols for General Engineering
	AS 1102 - Graphic Symbols for Electrotechnical Documentation
	AS 3702 - Item Designation in Electrotechnology
	AS 4383 - Preparation of Documentation used in Electrotechnology
	AS 60417 - Graphical Symbols for use on Equipment
	HB7 - Engineering Drawing Handbook issued by Standards Australia
Policies and procedures	[Enter text or hyperlink (if possible)]
Other documents	[Enter text or hyperlink (if possible)]

15.4 Attachments

Notes on electronic attachments:

- The drawing template ".dwt" files should be placed into your AutoCAD "Template" directory to be accessible when opening a new drawing.
- The line types ".lin" file should be placed into your AutoCAD "Support" directory.
- The pen table ".ctb" files must be placed into your AutoCAD "Plot Styles" directory to be accessible when plotting

Attachment	Title
1	Gen A1_drg_template.dwt , Standard AutoCAD drawing template for all other drawings prepared in "paper" space
2	Elec A1_drg_template.dwt , Standard AutoCAD drawing template for electrical drawings prepared in "paper" space
3	Line_types.lin , Supplementary AutoCAD line type definition file
4	Elec A1 size_print_pen table.ctb , Standard AutoCAD plot style pen table for A1 size prints of electrical drawings
5	Elec A3 size_print_pen table.ctb , Standard AutoCAD plot style pen table for A3 size prints of electrical drawings
6	Elec A3 size print_pen table.ctb , Standard AutoCAD plot style pen table for A1 size prints of all other drawings
7	Gen_A1 size_print_pen table.ctb , Standard AutoCAD drawing template for all other drawings prepared in "paper" space

16. Ownership

Role	Title
Group	Asset Lifecycle
Owner	Manager Asset Data Governance
Author	Romel Khaziran, Information Specialist

16.1 Change history

Version	Issue Date	Approved by	Brief description of change and consultation
6	28/02/2022	Les Smith	New Template Clause 3 Update Reference Clause 4 Update Reference Clause 5 EDMS added Clause 6.1 Numbering System EDMS Reference added Clause 6.2 New drawings number process EDMS Reference added Clause 6.3 New File Naming process EDMS Reference added Clause 7.8 (a) Title update Clause 7.8 (b) Added examples for Title 1 and Title 2
5	2/07/2015	Ken Wiggins	Clause 4 Template names Altered Clause 6.7(g) Signature box altered to allow supersede box Clause 13 Template names altered Appendix 3 Sample sheet altered to include superseded box
4	13/11/2014	Peter Gillman	General Document Revision
3	No Data	No Data	[Enter description]
2	No Data	No Data	[Enter description]
1	No Data	No Data	New document

Appendix 1 Layering Convention for CAD Drawings (excluding electrical)

Layer No.	Pen Thickness	Entity Colour	Usage
DEFPOINTS	N/A	WHITE	VIEWPORT FRAMES
10	0.7	BLUE	SOLID LINES, ARCS, ETC.
11	0.7	BLUE	DASHED LINES, ARCS, ETC.
12	0.7	BLUE	CENTRE LINES, ARCS, ETC.
13	0.7	BLUE	OTHER LINES, ARCS, ETC.
14	0.7	BLUE	DIMENSIONS
15	0.7	BLUE	BLOCK INSERTIONS
16	0.7	BLUE	INSTRUMENT LINES
17	0.7	BLUE	TEXT
18-27	0.7	BLUE	ANY OTHER 0.7mm LINE WORK
30	0.5	RED	SOLID LINES, ARCS, ETC.
31	0.5	RED	DASHED LINES, ARCS, ETC.
32	0.5	RED	CENTRE LINES, ARCS, ETC.
33	0.5	RED	OTHER LINES, ARCS, ETC.
34	0.5	RED	DIMENSIONS
35	0.5	RED	BLOCK INSERTIONS
36	0.5	RED	INSTRUMENT LINES
37	0.5	RED	TEXT
38 - 49	0.5	RED	ANY OTHER 0.5mm LINE WORK
50	0.35	YELLOW	SOLID LINES, ARCS, ETC.
51	0.35	YELLOW	DASHED LINES, ARCS, ETC.
52	0.35	YELLOW	CENTRE LINES, ARCS, ETC.
53	0.35	YELLOW	OTHER LINES, ARCS, ETC
54	0.35	YELLOW	DIMENSIONS
55	0.35	YELLOW	BLOCK INSERTIONS
56	0.35	YELLOW	INSTRUMENT LINES
57	0.35	YELLOW	TEXT
58 - 69	0.35	YELLOW	ANY OTHER 0.35mm LINE WORK
70	0.25	WHITE	SOLID LINES, ARCS, ETC
71	0.25	WHITE	DASHED LINES, ARCS, ETC
72	0.25	WHITE	CENTRE LINES, ARCS, ETC
73	0.25	WHITE	OTHER LINES, ARCS, ETC
74	0.25	WHITE	DIMENSIONS
75	0.25	WHITE	BLOCK INSERTIONS
76	0.25	WHITE	INSTRUMENT LINES
77	0.25	WHITE	TEXT
78 - 89	0.25	WHITE	ANY OTHER 0.25mm LINE WORK

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Layer No.	Pen Thickness	Entity Colour	Usage
90	0.18	GREY COLOUR 8	SOLID LINES, ARCS, ETC.
91	0.18	GREY COLOUR 8	DASHED LINES, ARCS, ETC.
92	0.18	GREY COLOUR 8	CENTRE LINES, ARCS, ETC.
93	0.18	GREY COLOUR 8	OTHER LINES, ARCS, ETC
94	0.18	GREY COLOUR 8	DIMENSIONS
95	0.18	GREY COLOUR 8	BLOCK INSERTIONS
96	0.18	GREY COLOUR 8	INSTRUMENT LINES
97	0.18	GREY COLOUR 8	TEXT
98 - 109	0.18	GREY COLOUR 8	ANY OTHER 0.18mm LINE WORK
110	1.0	MAGENTA	SOLID LINES, ARCS, ETC.
111	1.0	MAGENTA	DASHED LINES, ARCS, ETC.
112	1.0	MAGENTA	CENTRE LINES, ARCS, ETC.
113	1.0	MAGENTA	OTHER LINES, ARCS, ETC.
1 14	1.0	MAGENTA	DIMENSIONS
1 15	1.0	MAGENTA	BLOCK INSERTIONS
1 16	1.0	MAGENTA	INSTRUMENT LINES
1 17	1.0	MAGENTA	TEXT
1 18-129	1.0	MAGENTA	ANY OTHER 1.0mm LINE WORK
130	1.4	GREEN	SOLID LINES, ARCS, ETC.
131	1.4	GREEN	DASHED LINES, ARCS, ETC.
132	1.4	GREEN	CENTRE LINES, ARCS, ETC.
133	1.4	GREEN	OTHER LINES, ARCS, ETC.
134	1.4	GREEN	DIMENSIONS
135	1.4	GREEN	BLOCK INSERTIONS
136	1.4	GREEN	INSTRUMENT LINES
137	1.4	GREEN	TEXT
138-149	1.4	GREEN	ANY OTHER 1.4mm LINE WORK
150	2.0	CYAN	SOLID LINES, ARCS, ETC.
151	2.0	CYAN	DASHED LINES, ARCS, ETC.
152	2.0	CYAN	CENTRE LINES, ARCS, ETC.
153	2.0	CYAN	OTHER LINES, ARCS, ETC.
154	2.0	CYAN	DIMENSIONS
155	2.0	CYAN	BLOCK INSERTIONS
156	2.0	CYAN	INSTRUMENT LINES

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Layer No.	Pen Thickness	Entity Colour	Usage
157	2.0	CYAN	TEXT
157-169	2.0	CYAN	ANY OTHER 2.0mm LINE WORK

Appendix 2 Layering Convention for CAD Drawings (Electrical)

Layer No.	Pen Thickness	Entity Colour	Usage
DEFPOINTS	N/A	WHITE	VIEWPORT FRAMES
	0.25	MAGENTA	SOLID LINES, ARCS, ETC
2	0.25	CYAN	SOLID LINES, ARCS, ETC
3	0.25	GREEN	SOLID LINES, ARCS, ETC
5	0.25	MAGENTA	SOLID LINES, ARCS, ETC
6	0.25	MAGENTA	SOLID LINES, , ETC
10	0.7	BLUE	SOLID LINES, ARCS, ETC
11	0.7	BLUE	DASHED LINES, ARCS, ETC.
12	0.7	BLUE	CENTRE LINES, ARCS, ETC.
14	0.7	BLUE	OTHER LINES, ARCS, ETC.
15	0.7	BLUE	SOLID LINES, ARCS, ETC.
28	0.7	BLUE	TEXT
31	0.5	RED	DASHED LINES, ARCS, ETC.
32	0.5	RED	CENTRE LINES, ARCS, ETC.
34	0.5	RED	OTHER LINES, ARCS, ETC.
35	0.5	RED	SOLID LINES, ARCS, ETC.
48	0.5	RED	TEXT
51	0.35	YELLOW	DASHED LINES, ARCS, ETC.
52	0.35	YELLOW	CENTRE LINES, ARCS, ETC.
54	0.35	YELLOW	OTHER LINES, ARCS, ETC.
55	0.35	YELLOW	SOLID LINES, ARCS, ETC.
68	0.35	YELLOW	TEXT
71	0.25	WHITE	DASHED LINES, ARCS, ETC.
72	0.25	WHITE	CENTRE LINES, ARCS, ETC.
74	0.25	WHITE	OTHER LINES, ARCS, ETC.
75	0.25	WHITE	SOLID LINES, ARCS, ETC.
88	0.25	WHITE	TEXT

Appendix 3 Sample title Block Layout

