



# SOUTHERN PORTS AUTHORITY PORT OF ESPERANCE

## ENGINEERING DRAFTING STANDARDS

*Disclaimer: The information in the numbering standards can change at the owner's discretion and may not be complete.*

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**Document Users : All Personnel**

**Revision Trigger : 3 Yearly or Operational Change**

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03	M Zagdan	Tony Connor		29/7/2013	Update Title Block. Clarify section 4 Drawing Numbers (use of EPSL)
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## **1. PURPOSE**

This document details the Computer Aided Design (CAD) standard set by Southern Ports Authority, Port of Esperance (PoE) for civil, structural, mechanical and electrical drawings. This document's purpose is to establish a reference in order to guide the user towards PoE's standard drawing methods.

All AutoCAD drawings are to be accomplished to a sufficient set standard to allow all information to be utilised effectively by PoE.

Adherence to this standard ensures that records set by PoE are consistent and accessible. It also proves a standard which can be audited against.

These standards and practices apply to engineering drawings produced by POE employees and those produced on behalf of PoE by consultants, vendors, designers or contractors, hereafter referred to as "the Contractor".



## 2. GENERAL REQUIREMENTS

This document, drawing practice shall conform to the relevant Australian Standards:

**AS 1100 – Technical Drawing**

**AS 1101 – Graphical Symbols for General Engineering**

**AS 1102 – Graphical Symbols for Electro technical Documentation**

**AS 4383 – Preparation of documents used in Electro technology.**

The Port of Esperance requires all drawings to be prepared in AutoCAD 2011 or later drawing file format.

All engineering drawings prepared for the Port of Esperance must conform to the requirements of this document, unless variation is applied in the contract. The Contractor shall modify non-compliant drawings at their own cost.

Drawings by the Contractor should be in AutoCAD format prepared in A3 size using the supplied *POE Title Block*, sample illustrated in Appendix 2.

“As Built” drawings will remain the copyrighted property of the Port of Esperance and cannot be used for the preparation of any other project by the Contractor out of this contract. Contractor feedback and suggestions are welcome.



### **3. DRAWING FILE TEMPLATES**

The Port of Esperance has a standardised template that will be supplied to the Contractor. This is a set template for use in the preparation of drawings:

- **POE Title Block (this will be sent as an attachment)**

This template as shown in Appendix 2 shall be used and not renamed in any way. Further clarify on the title block completion can be found in Section 9.4. The title block contains variable fields defined using AutoCAD “Attributes” for information input.

The title block requires the Contractor’s full company name, address, ABN number, telephone number, e-mail address to be added in the area stipulated in Appendix 2. The Contractor may add additional data to this such as contract number etc. if preferable but may not go out with this area.



## 4. DRAWING NUMBERS

See **Appendix 1** for set Numbering Standards.

The Contractor must obtain drawing numbers prior to commencing drafting work in order to avoid back drafting with the possibility of cross-reference errors.

Drawing numbers will be constructed as per Appendix 1 and if unsure further clarification can be required through contact of POE's drafting department.

**Drawing Number:** COMPANY NAME (or project No.) – AREA CODE – DISCIPLINE CODE – DRAWING TYPE CODE – SEQUENTIAL NUMBER – SHEET NUMBER (optional)

E.g. **POE-B3-E-SE-001-01** (with sheet number)

E.g. **POE-B3-E-SE-001** (without sheet number)

*Note the Company name POE shall be used for all drawings generated by the POE drawing office and must not be used in contractor drawings.*

Contractor drawing numbering systems that do not conform to the above system shall be submitted to the POE Engineer for approval before use.

## 5. DRAWING TITLE NAME

The Port of Esperance requires the drawing file name to be sent in the following format.

**File Name:** COMPANY NAME – AREA CODE – DISCIPLINE CODE – DRAWING TYPE CODE – SEQUENTIAL NUMBER – SHEET NUMBER (optional) \_ Revision Number.

E.g. **POE-B3-E-SE-001-01\_A.dgn** (with sheet number)

E.g. **POE-B3-E-SE-001\_A.dgn** (without sheet number)



## 6. REVISION NUMBERING

Letters A, B, C etc. are issued for review  
REV 0 is “issued for use” once all revisions are complete.  
REV 1, 2, 3 are modifications to the drawing after issue.

**REV A** – is a drawing issued for initial review.  
**REV B** – Comments from REV A addressed, POE review it again and make any minor comments.  
**REV C** – If POE are satisfied then it is signed off and issued as  
**REV 0** – For Use  
Then if further changes need to be made, issues **REV 1** etc.

When stored on the network the file name would be:  
POE-CC-E-SC-001\_A.dgn  
POE-CC-E-SC-001\_B.dgn  
POE-CC-E-SC-001\_C.dgn  
POE-CC-E-SC-001\_0.dgn  
POE-CC-E-SC-001\_1.dgn

## 7. SHEET NUMBERS

Sheet numbers only to be used when drawings for sub-system cannot fit on one sheet.

E.g. if HV single line diagram cannot fit on one sheet, you may have Sheet 1 with one half of the switchboard SLD and sheet 2 with the other half of the switchboard SLD.

Adding sheets is not to be used for unrelated subsystems.



## 8. DRAWING TITLE

The drawing title as specified by PoE is as follows:

LINE 1: Port of Esperance  
LINE 2: Area  
LINE 3: Item of Plant  
LINE 4: Drawing description

**e.g.**

LINE 1: Port of Esperance  
LINE 2: Iron Ore Storage Shed 3  
LINE 3: MCC-08 24VDC Supply Panel  
LINE 4: Schematic

**e.g.**

LINE 1: Port of Esperance  
LINE 2: Sulphur Conveyor CV40  
LINE 3: CV40 Belt Drive  
LINE 4: General Arrangement





## 9. DRAWING FILE SPECIFICATION

Types of drawings required by POE are Schematics, Single Line Drawings, Cable Schedules, Wiring Diagrams, Models, Pand ID, Layouts, Structural, Geospatial location drawings etc.

POE have set the below drawing file specifications to follow in adherence to our AutoCAD standards.

### 9.1 TEXT STYLES

The Port of Esperance requires all text to be uppercase for general usage.

The text style should be defined as follows:

**Style name:** TT ARIAL  
**Height:** 0  
**Width Factor:** 1.0  
**Oblique Angle:** 0  
**Backwards:** N  
**Upside – down:** N  
**Vertical:** N

**Text Height Line Weight Typical Usage:**

3mm 0.35mm General notes, labels, materials list, dimensions etc.

5mm 0.5mm Minor view & section titles, minor headings etc.

7mm 0.7mm Major view & section titles, major headings etc.

There may be occasion that requires the use of other fonts. POE will accept this when TT Arial cannot be achieved. The alternative font used must be clearly legible, AutoCAD text font and the associated text style name shall match the font name.

SHX format shall be used on 3D Models. Roman T and Rohan C SHX.

### 9.2 DIMENSIONING STYLE

The dimensioning style shall be governed by Australian Standard AS 1100.

The AutoCAD dimensions style used shall be "ISO-25" Each dimension shall be a single AutoCAD entity. "Exploded" dimensions are not acceptable.

### 9.3 LINE TYPES



The line type shall be achieved by setting the AutoCAD entity's "Linetype" property to "ByLayer" Colour to be set "ByLayer".

Drawings supplied to PoE utilising the AutoCAD "paper space/model space" feature shall have the AutoCAD system variables "Ltscale" set to "1".

The Port of Esperance requires any customised line types to be defined for use in metric drawings (i.e. Line types designed for imperial drawings shall not be scaled to suit metric drawings).

#### **9.4 TITLE BLOCK INFORMATION**

The following Title block should be done in conjunction with Appendix 2 – PoE Sample Title Block Layout for Contractors

POE requires the drawing title block to be completed in plain English. The contractor should complete as follows:

- The drawing title will accurately describe the contents of the drawing. The title block has sufficient attributes for a 4 line title as per Section 8.
- The title block requires the Contractor's full company name, address, ABN number, telephone number, e-mail address to be added in the field allocated for the Contractor.
- The relevant first initials will require to be filled in the appropriate field "ENG", "DRAWN" and "CHECKED" by the Contractor.
- If given the project number should be inserted in the field defined.
- Title block revision field should be as per Section 6.
- The "status descriptor" field is required to be updated with reflection on the drawing stage e.g. "For Review" "As Built" "Released" "Draft" "Conceptual" etc.
- The scale field shall be filled in sufficiently.



## **9.5 PLOTTED DRAWING IDENTIFICATION**

Where the plotted drawing uses coloured line work, the colours selected for the line work 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. No yellow is to be used as this makes it difficult to interpret the drawing.

Grid and snap features are standardised and used for electrical schematic drawings. All schematics supplied should be devoid of any colour and supplied in black and white only. PoE requires grid spacing to be 4.6. Drawings are to be snapped into alignment. All schematics are to be in horizontal format.

## **9.6 LEGEND DRAWINGS**

A legend of drawings is to be supplied by the contractor of all drawings created for POE. This should be in excel format and show the fields of drawing path name, description, date & revisions submitted to POE, author and modification descriptor. Contractors can use their own format as long as it shows the fields required above. Example shown in Appendix 3.

## **9.7 GEOMETRY CHECKING**

Drawings showing Geometrical data shall be checked for correctness and accuracy.

## **9.8 SHEET SIZE**

Electrical maximum for drawings is to be set at A2, Minimum requirement is A3.

A1 is only to be used if it is impossible to split drawings. A0 is only to be used if warranted and approvals obtained.

## **9.9 ORIENTATION OF PLANS**

The orientation of plans is to be shown by a north point symbol to top of page. Where appropriate a scale must be included.

The naming of the drawings should be comprehensible to all PoE employees. If a drawing title is deemed illegible or inappropriately named in relation to the contents of the drawing this will be returned to the Contractor for alteration.

## **9.10 XREF DRAWINGS**



**SOUTHERN PORTS AUTHORITY**  
*Port of Esperance*

Title: **Engineering Drafting Standards**

**Document No :** MA020  
**Revision:** 05  
**Issue Date:** 19/12/2014  
**Page:** 12

All xref drawings are to be offered in the same folder as the master drawing so that the link between them is not broken.



## **10. MODIFICATIONS TO DRAWINGS**

When drawings are modified or updated, the title block “Revision” field will be subsequently updated with the current sequential number. Revision clouds, amendment triangles or diamonds can be used to illustrate the modifications to the drawing/drawings. Although during the “As Built” stage these revision clouds, amendment triangles and diamonds must be removed from all drawings.

### **10.1 SUPERSEDED DRAWINGS**

A Superseded drawing is a drawing that has been replaced by a drawing with a different number. Superseded drawings are to be crossed out with double lines drawn in AutoCAD from the bottom left hand side of the drawing to the top right hand side and clearly marked with the words “**Superseded**” The superseded drawing should reference on the drawing, the drawing that it has been replaced by.

### **10.2 CANCELLED DRAWINGS**

A drawing which has been cancelled is a drawing that is redundant due to the removal of equipment. This type of drawing is also to be marked by crossing out with double lines drawn in AutoCAD from the bottom left hand side of the drawing to the top right hand side and clearly marked with the words “**Cancelled**”.

Any superseded or cancelled drawings are to be clearly and boldly marked up as such and archived separately from any other working drawings.



## **11. OLD DRAWING FILES**

Any old drawings constructed before the “Engineering Drafting Standards” will not be required to follow these set guidelines.

PoE would like all older drawings to follow the same structure set during their drawing process.



## **12. COMPLETED DRAWINGS**

The Port of Esperance requires that all drawings prior to submission are edited by the Contractor to remove all entities which are not part of the final design. Any detail which is not of relevance to the final design will be required to be removed.

The AutoCAD “Purge” command is to be used by the Contractor in order to remove any irrelevant blocks, layers, text styles etc. Also it is a requirement that the “Audit” command be used to check for any database errors, encryption and that any passwords are removed.

If AutoCAD cannot find the X-Ref files because the Contractor stored them on his own path the drawings will be incomplete. This will not be accepted by PoE. The Contractor is required to make sure all AutoCAD files can be accessible. All X-Ref files are to be blocked.

POE will check all data submitted for the presence of any computer virus.

## **13. SUPPLY OF DRAWINGS**

The unique drawing number (Appendix 1) is imperative for any drawing submission by the Contractor. Drawings not stipulating PoE’s numbering structure will be immediately rejected.

All drawings must be prepared in compliance with this document. If there is any reason that may suggest otherwise the AutoCAD version may be requested by PoE in order to verify whether their standards are being met.

In the first instance PDF’s are offered up for correction by the Contractor. On project completion, PoE requires all drawings to be submitted electronically in both AutoCAD DWG and Adobe PDF formats. This is subject to change if the contract between the two parties stipulates otherwise. Contractors are required to give copyright to PoE.



## **14. SUPPLY OF AS BUILT DRAWINGS**

As Built drawings will be supplied to the Port of Esperance clearly stipulating on the status description box “As Built”.

As Built drawings prepared for PoE by Contractors are required to be supplied. These are to be issued in both AutoCAD DWG and PDF formats.

The preparation of As Built drawings shall conform to the following PoE standards:

- AutoCAD drawings that state “As Built” are the final issue of the drawings.
- The revision field will be updated with the relevant sequential number.
- The revision block will be updated with the current sequential revision number, Contractor’s initials, date submitted, clear revision description set as “As Built” the initials of the Contractor’s checker and approver.
- Amendment triangles or diamonds that highlight any previous modifications made should be removed from all As Built drawings.





## **15. SUPPORT DOCUMENTATION**

The contractor is required to submit the AutoCAD and PDF drawing files. This must be supplied in a format to enable the Port of Esperance staff to reliably reproduce plotted copies of the original drawings.

If the use of non-standard and/or third party products, drawings etc. requires the Port of Esperance approval this must be obtained ahead of use.

When supplied with any support files, these are to be given an unrestricted license to POE on all these files.

## **16. APPENDICES**

**Appendix 1: POE Drawing Numbering Structure**

**Appendix 2: POE Sample Title Block Layout for Contractors**

**Appendix 3: Example Excel Legend Format for Contractors**



## APPENDIX 1: POE DRAWING NUMBERING STRUCTURE

		AREA CODE		TYPE CODE	SEQ.
Electrical	<b>POE-</b>	(See Table 1)	<b>-E-</b>	(See Table 2)	-XXX
Structural	<b>POE-</b>	(See Table 1)	<b>-S-</b>	(See Table 2)	-XXX
Mechanical	<b>POE-</b>	(See Table 1)	<b>-M-</b>	(See Table 2)	-XXX
Civil	<b>POE-</b>	(See Table 1)	<b>-C-</b>	(See Table 2)	-XXX
Data	<b>POE-</b>	(See Table 1)	<b>-D-</b>	(See Table 2)	-XXX

**Table 1 – Area Code**

B3	Berth 3
RCD	Rotary Car Dumper
S1	Shed 1
S2	Shed 2
S3	Shed 3
S4	Shed 4
B2	Berth 2
CC	Container Crane
NT	Nickel Tipper
BS	Black Swan
SS	Sulphur Shed
MCC??	Motor Control Centre (this must be followed by the relevant number)
HV	Sub Station or Switch room
AD	Admin
PO	Port Overview
CV??	Conveyor (followed by conveyor number)



**Table 2 – Drawing Type Code**

BD	Block Diagram
CD	Cable Drawing
DD	Detail Drawing
GA	General Arrangement
SD	Single Line Diagram
SC	Schematic
TD	Termination Drawing
ST	Shop Detail
LI	Liner Drawing
CS	Cable Schedule
LP	Layout Plan
LB	Label Drawing

E.g. **POE-B3-E-SE-001-01** (*with sheet number*)

E.g. **POE-B3-E-SE-001** (*without sheet number*)

