DEVELOPMENT DESIGN SPECIFICATION

D15

DRAFTING SPECIFICATIONS

Amendment Record for this Specification Part

This Specification is Council's edition of the AUS-SPEC generic specification part and includes Council's primary amendments.

Details are provided below outlining the clauses amended from the Council edition of this AUS-SPEC Specification Part. The clause numbering and context of each clause are preserved. New clauses are added towards the rear of the specification part as special requirements clauses. Project specific additional script is shown in the specification as italic font.

The amendment code indicated below is 'A' for additional script 'M' for modification to script and 'O' for omission of script. An additional code 'P' is included when the amendment is project specific.

Amendment Sequence No.	Key Topic addressed in amendment	Clause No.	Amendment Code	Author Initials	Amendment Date
0	Customisation for Hastings Council Local Government Area	All	OAM	HC	02/09/03
1	Revised layer structure and document modified to reflect current practice	ALL	OAM	PMHC	19/12/13

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DEVELOPMENT DESIGN SPECIFICATION D15

Drafting Specifications for Computer Aided Design (CAD)

GENERAL

D15.01 SCOPE

1. This specification sets out the requirements for the preparation and submission of electronically created plans to Port Macquarie Hastings Council (PMHC). The requirements shall be applicable to all drafting work whether undertaken by Council, the Developer, the Developer's Project Manager, Consultant or a Sub-consultant. ***Computer Aided Design (CAD)***
2. This specification shall apply to all CAD plans that are to be submitted to PMHC, including, but not limited to: work-as-executed plans; out sourced design plans; and development applications.
3. The requirements of the Engineering Design Specifications D1 to D14 are a prerequisite to any drafting Standards and Specification provided in this document. ***Prerequisite***

D15.02 OBJECTIVES

1. The intent of this specification is to stipulate a standardised system for all plans that are submitted to PMHC utilising standard layer names, colours and linestyles ***Standardisation***
2. Drafting of design drawings shall be definitive and clearly presented with information clearly legible in both the electronic presentation and on the hard copy drawings produced. ***Design Presentation***
3. The information shown on the drawings shall be logically prepared on relevant layers. Illogical and onerous grouping of information on the drawings shall be avoided. Drawings shall be on Councils A1 size sheets and shall be suitable for black and white printing, copying and photo reduction to A3 paper size without loss of clarity. ***Electronic Drawing Formulation***
4. It is also an objective to develop a system of documentation of all the plans relevant to the upkeep of Council's assets management systems. ***Documentation***

D15.03 REFERENCE AND SOURCE DOCUMENTS

All drawings shall comply to the current relevant Australian drawing standards and the Council Specifications as listed below:

(a) Council Specifications

Construction Specifications

CQS	-	Quality System Requirements
CQC	-	Quality Control Requirements
C101	-	General
C211	-	Control of Erosion and Sedimentation
C220	-	Stormwater Drainage - General
C221	-	Pipe Drainage
C222	-	Precast Box Culvert
C223	-	Drainage Structures
C224	-	Open Drains including Kerb & Gutter
C230	-	Subsurface Drainage - General
C231	-	Subsoil and Foundation Drains
C232	-	Pavement Drains
C233	-	Drainage Mats
C242	-	Flexible Pavements
C244	-	Sprayed Bituminous Surfacing
C245	-	Asphaltic Concrete
C247	-	Mass Concrete Sub-base
C248	-	Plain or Reinforced Concrete Base
C254	-	Segmental Paving
C262	-	Signposting
C263	-	Guide Posts
C264	-	Guard fence
C273	-	Landscaping
C401	-	Water Reticulation
C402	-	Sewerage System

Design Specifications

DQS	-	Quality Assurance Requirements for Design
D1	-	Geometric Road Design
D2	-	Pavement Design
D3	-	Structures, Temporary Works and Bridge Design
D4	-	Subsurface Drainage Design
D5	-	Stormwater Drainage Design
D6	-	Site Regrading
D7	-	Stormwater Management
D8	-	Waterfront Development
D9	-	Cycleway and Pathway Design
D10	-	Bushfire Protection
D11	-	Water Reticulation
D12	-	Sewerage System
D13	-	Land and streetscape Design
D14	-	Work as Executed Plans
D15	-	CAD Requirements

(b) Australian Standards

AS 1100 - Technical Drawing - General Principles
AS 1101 - Graphic Symbols For General Engineering
ISO 128.1 – Technical Drawings – General principles of presentation
ISO 128.20 – Technical Drawings – General principles of presentation - Basic conventions for lines
ISO 128.21 – Technical Drawings – General principles of presentation - Preparation of lines by CAD systems

ISO 128.22 – Technical Drawings – General principles of presentation - Basic conventions and applications for leader lines and reference lines.
ISO 128.23 – Technical Drawings – General principles of presentation - Lines on construction drawings.

ISO 128.30 – Technical Drawings – General principles of presentation - Part 30 Basic conventions for views.
ISO 128.40 – Technical Drawings – General principles of presentation - Part 40 Basic conventions for cuts and sections.
ISO 128.50 – Technical Drawings – General principles of presentation - Part 50 Basic conventions for representing areas on cuts and sections.
ISO 129.1 – Technical Drawings – Indication of dimensions and tolerances -Part 1: General Principles.

D15.04 GENERAL DRAFTING REQUIREMENTS

1. Refer to Quality Assurance Requirements For Design (DQS) Part DQS.05 of the AUS-SPEC#1 Design Specifications. ***QA***
2. The model shall be drawn at 1:1 scale with 1 drawing unit equal to 1 meter. (Note: this is contrary to AutoCAD default drafting procedure where 1 unit = 1 millimetre). Drawing Sheets are to be provided at the appropriate scale (Refer AUS-SPEC D1.06) & provided in paper space as per procedure at **Appendix B** Application of Paper Space and Model Space. ***Scale***
3. Coordinate systems shall be maintained throughout the drawings. ***Coordinates***
   All works shall be provided on the MGA coordinate system within the model space. i.e. Orientation to north and at true scale.
   Plans must not be scaled to the coordinate system.
   Note: Engineering surveys are generally performed on the basis of a flat-plane, over large areas adjustments in accordance with standard survey practice is required to account for the curvature of the earth, this can be accomplished by converting the data to a geocentric coordinate system such as MGA.
4. The adopted datum for all plans shall be Australian Height Datum 71 (AHD71). ***Datum***
5. l design plans shall be submitted using the PMHC supplied A1 Standard Title Block. The Title block shall be used in Paper Space only, with the Model referenced using viewports at an appropriate scale. ***Title block***
6. Plan views should be orientated left to right with the North point up the page. ***Views***
7. If any extractions from the model are drawn as blow-up details, for such purposes the drawing scale shall be noted with the extraction. ***Blow-up Details***
8. Drawings shall contain standard notes appropriate to the field of engineering covered by the drawing. These notes shall specify the Australian Standard codes, Council Standards & Specifications by which the work concerned must conform to. ***Standard Notes***
9. Non-standard notes defining specific aspects of the work(s) shall be included, where appropriate, on the recommendation and/or approval of the certifying designer. ***Non Standard Notes***
10. Each drawing shall display an appropriate scale bar. ***Scale Bar***

11. Drawings containing a Location or Site Plan shall contain a North Symbol adjacent to the site Plan. The orientation of blow-up details shall also be marked appropriately to assist with site set out and to enhance the checking process. ***North Symbol***

12. Drawings shall contain a standard or modified Legend. ***Legend***

13. Section Symbols given in the Standard block shall be used for marking section detail locations. ***Section Symbols***

14. Drawing file size shall be kept in consideration (10Mb can generally be emailed) and extremely large file sizes shall be avoided. External references (XREF's) may be used for cumulating the information where it is logical to separate the information contained from the main drawing. ***File Size***

15. AutoCAD layouts tabs are to be numbered according to sheet number and may contain a brief description of the sheet content (e.g. 1-Plan, 2-Xsect etc.). ***Layouts***

D15.05 RECORDS

1. Refer to Quality Assurance Requirements For Design (DQS) Part DQS.07 of the AUS SPEC#1 Design Specifications. ***AUS-SPEC***

2. All drawings shall conform to the PMHC's standard drawing registration and electronic file naming conventions. Drawings registration number will be provided by PMHC. Both the Drawing Registration Number and Electronic file name shall be documented on the drawing in the title block at the allocated space. ***Drawing Registration & Electronic File Name***

3. All attributes shall be complete in the template title block. ***Title Block***

4. An appropriate description shall be filled-in on each drawing sheet, to reflect the status of the drawing. For example: "Preliminary Drawing", "Draft", "Advance Copy", "Tender Drawing, "Construction Drawing", etc. ***Status***

5. Clouding of drawing changes may be carried out for Construction Stage Revisions. All previous revision clouds and marks are to be removed when upgrading to the next revision. A brief description of the change is to be written on the description line relevant to the new issue. All revisions need to be approved and drawings need to be initialed in the relevant boxes by the appropriate authority. The revision descriptions should be specific. Statements like "Updated", "Minor Changes", "Issued for Review", "Construction Issue" etc. shall not be used. ***Clouding***

6. A senior Design Technician or Engineer with appropriate tertiary qualifications must certify the drawings, following a thorough and independent check of all sheets in the drawings. ***Quality Assurance***

7. All drawings are to be saved in AutoCAD 2008 DWG format or later version on approval of council's Principal Design Engineer. ***Format***

8. Drawings must be zipped on completion using AutoCAD's E-transmit option to include all Dim Styles, Text styles etc. Refer to **D15.10** Project / Drawing Finalisation. ***ZIP***

9. Images may be inserted for Aerial Photos & Locality sketches or for digital photos but as per point 8 above, must be included with the final electronic issue of the documentation to allow complete replication of the final drawings if required in the future. ***Images***

D15.06 LAYER SYSTEM

1. PMHC have developed a standard layer system for CAD plans as detailed in **D15.15** & **Appendix A**. Electronic plans submitted to Council shall conform to these requirements. ***Layering Conventions***
2. If the designer/draftsperson identifies an object that does not logically fall within the standard layers created in the PMHC prototype drawing they may document the addition on the "Readme" Layer. ***Non Standard Layers/Aspects***
3. Entities shall not be placed on the Layer 0 (zero) or the DEFPOINTS layer. Layer 0 may only be used when making standard blocks ***Special Layers***
4. Line types, Fonts, Text heights, and associated colour shall not be changed by the entity i.e. Entity characteristics shall be retained "BYLAYER" for all those layers where these properties have been predefined. If necessary to have specific entity properties then appropriate general purpose layers or layers with no predefined characteristics shall be used for drafting. ***Non Standard Entity Properties***
5. External references may be used however PMHC prefer to limit XREF's to information that may change throughout the design process e.g. cross sections, long sections etc. Refer section D15.11 regarding project finalisation. ***XREF***
6. Freeze/Thaw shall be used to control a layers visibility within a drawing (or view port). A layer that is not required to be displayed in a drawing is to be frozen. (This is a useful way to permanently control the display of x referenced drawings within the current drawing) ***Freeze/Thaw***
7. On/Off shall be used to hide a layer temporally for drafting purposes only. All layers are to be turned on for saving a drawing or for plotting. ***On/Off***

D15.07 TEXT

1. The font, unless otherwise approved shall be Arial Narrow. The standard width factor shall be 1.0. Alternative fonts have been used in the Title Block for clarity. ***Font***
2. Only generic text and dimensions shall be drawn in model space (i.e. Road Names, lot numbers). Specific text including construction notes, drawing notes, text tables (set out), titles or title block information is to be located in paper space.* ***Model / Paper Space***
3. Linestyles containing letters should read from left to right and from bottom to top of sheet. This may involve manual editing of the survey; "reverse" command in AutoCAD and "string reverse" command in 12D can assist this process.
4. Text will generally be located in layers D TEXT, D DIMENSIONS or D NOTES. A layer sub-group may be added to a text layer name if required, for example the layer D DIMENSIONS BRIDGE may be created if warranted.
5. All general text in the drawing shall be horizontal to the drawing sheet.
6. For documentation and editing of long text scripts, the Mtext command shall be preferred to the Text command. ***Mtext***
7. Place a space between a numeral and the unit name or abbreviation to which it refers to (i.e. 20 mm) ***Spacing***
8. A space shall not be used between a degree symbol and the unit name (i.e. 27^{o}F or 50^{o}25'30").
9. Spaces shall not be used before and after slash (/) e.g. km/hr.
10. Text location and general drafting principles shall apply as per AS1100.101

* It is accepted that preference between the location of text in model space or paper space varies across the industry. PMHC's preference is for text to be as per note 2 however drawings will be accepted with text in the model space provided it can be managed without the need to duplicate all or parts of the model.

D15.08 DIMENSIONS

1. Settings and styles established in PMHC template drawing file shall be used at all times. ***Dimension Style***
2. Dimensioning of objects shall be in accordance with AS1100.101: General principles ***Dimensioning Conventions***

D15.09 BLOCKS

1. Blocks shall be employed for standard features. Current standard blocks are located in the PMHC template drawing (refer **Appendix C**). ***Standard Blocks***
2. If standard blocks are needed where all entities would be on the same layer they shall be created on layer 0 with a colour and linetype set "By Layer", allowing adoption of the colour and linetype from the current layer when they are inserted. Exceptions to this rule would be blocks created and inserted on layer "Symbols" and more complex blocks requiring many different linetypes. ***Requirements for Block Creation***
3. Unless different sizes are specifically required, blocks shall be inserted at the same scale every time they are used. Symbols such as donuts, arrowheads, and call-out bubbles shall have uniform size, shape & function. This applies to all aspects of the drawing ***Insertion Scale***
4. Unless approved, inserting blocks with different X & Y scales is not permitted. ***Scale Distortion***
5. An up-to-date list of Blocks with Attributes is shown in **Appendix C** along with its fields. ***Blocks with Attributes***
6. All drawings shall use Councils Standard Title Page and use Councils Standard Title Block for subsequent plan sheets. Current standard drawing title page and standard title blocks are included in **Appendix D** and downloadable from council's website. All information is to be filled in the provided Title Block. ***Standard Title Page & Standard Title Block***

D15.10 PLOTTING

1. Plotting shall use the PMHC mono CTB file to plot to black or the PMHC colour CTB file to plot to colour. Colour may be used in final plots provided no pale colours are used that may be lost through photocopy. ***Plotting Procedure***

   Plot Settings CTB files are included at **Appendix F**

D15.11 PROJECT/DRAWING FINALISATON

1. On completion of a drawing it shall be set as follows: ***Final Settings***
   - Save drawing at "ZOOM EXTENTS" in Paper space.

- Purge drawing of un-referenced blocks, layers, text styles etc.
- Turn off “GRID”.
- Turn on “UCS Icon”.
- All layers to be turned on, except for README and VPORT Layers (freeze command should ensure viewports contain only the required information).
- Final drawings must be provided to PMHC as a complete package, Xref’s are to be bound into the main drawing and all drawings are to be packaged using the AutoCAD e-transmit command.
- Leave the drawing with variables set as listed in table **D15.13**

D15.12 DESIGNERS QUALIFICATIONS

1. Refer to Quality Assurance Requirements for Design (DQS) Part DQS.06 of the AUS-SPEC#1 Design Specifications.

D15.13 CERTIFICATION AND CHECKLISTS

1. The Developer, responsible Council Officer or Contract Supervisor shall submit Design and Work-as-Executed plans to Council’s nominated representative for acceptance. Each set of plans shall be accompanied by a Certification Report that will be signed by the Developers Consultant, responsible Council Officer or Contract Supervisor. The Certification Report will comprise the certificate and check lists set out in Annexure DQS-A of the Quality Assurance Requirements for Design (DQS) of the AUS-SPEC#1 Design Specification. ***Check List***

2. For quality assurance purposes, a checklist must be filled in and accordingly a quality assurance certificate issued confirming that the drawing is fully conforming to **DQS-Quality Assurance Requirements for Design, Hastings**. ***Quality Assurance***

3. The final drawing will be checked for clarity and compliance with the template drawing prior to acceptance. ***Acceptance of final drawings***

D15.14 AUTOCAD INFORMATION

For AutoCAD commands such as “Blocks, Attributes, External References and ATTDEF command”, refer to the Help file or AutoCAD manual for an explanation of their specific use.

Variable	Setting
ATTDIA	1
CMDDIA	1
FILEDIA	1
FILLMODE	1
GRIPS	1
HIGHLIGHT	1

Table D15.14.1 Common AutoCAD settings

D15.15 DRAWING REGISTRATION NUMBER

For information, PMHC uses drawing registration numbers based on the type of project and its location The Drawing Registration Number shall be allocated by PMHC.

A consultant may insert a personal company identification number within the title block however the registration number provided by PMHC must be the most prominent drawing identification.

D15.16 LAYERING STANDARDS

PMHC have adopted a CADD layering system to provide consistency between drawings. The layering system provides a standard approach to the naming of layers to enable data to be easily sorted by a Layer Prefix; Layer Group and in many cases a Layer sub group which generally correlates with the survey code.

There is flexibility to accommodate additional layers, but any change has to be according to Section D15.06.

Layer prefix Describes the Origin of the data (refer table **D15.15.1** below)

Layer Group Descriptive grouping of the data (refer table **D15.15.2** below)

Layer Sub-group Generally the survey code or a descriptive abbreviation of the feature.

Note: All layer names shall be UPPERCASE.

Table D15.16.1 Layer Prefix

Layer Prefix	Description
E	EXISTING data from other jobs*
S	SURVEY
D	DESIGN
P	SURVEY PEG OUT / SETOUT POINTS
G	INFORMATION IMPORTED FROM GIS DATA
F	FUTURE work not in the current proposed construction work
R	REMOVAL / DEMOLITION
X	EXTERNAL REFERENCE
0	AutoCAD default Layer (In Hastings D15 specifications it is reserved for Block creation)
W	Work As executed
README	For documentation of non-standard features of the drawing.
TITLE	TITLE BLOCK
VIEW	VIEWPORT

* Existing Data older than five years shall only be used at the discretion and approval of the Principal Design Engineer or Project Manager and is generally only used for information purposes.

LAYERING GROUPS

Common layer groups (including the layer prefix) have been added to council's template AutoCAD drawing. Additional groups may be added as deemed warranted for the project. Table 15.16.

Table D15.16.2 Common Design Layer Groups

Layer Group
BRIDGE
CADASTRE
COMMUNICATIONS
DETAIL
DIMENSIONS
ELECTRICAL
FORESHORE
FURNITURE
LANDSCAPING
LINEMARKING
NOTES
ROAD
SEWER
SIGNAGE
STORMWATER
STRUCTURAL
TEXT
VEGETATION
WATER

D15.17 LAYERS CREATED BY SURVEY DOWNLOADS

Information downloaded from survey to a civil design package shall be downloaded into layer groups to allow a logical grouping of survey information. Appendix A below shows layer group names. Not all layer groups will be present in any given project.

Use of the PMHC 12D mapfile allows for download of the survey to 12D and sorts data into the layer system by reading the survey codes as outlined in Appendix A. Use of the mapfile also allocates data a color and lifestyle similar to the final AutoCAD drawing. Use of the PMHC template AutoCAD drawing will allow export of the survey from 12D to AutoCAD reading colours by layer.

Appendix A relates to survey information only; PMHC AutoCAD Templates and 12D templates contain additional design layers.

Steps to download survey and produce a CAD output to PMHC standards:

1. Undertake topographical survey using codes as outlined in **Appendix A**

2. Use PMHC 12D mapfile to download survey data to 12D

3. Check survey in 12D and undertake any necessary edits

4. Export survey to an AutoCAD drawing using the PMHC template drawing: 12D Export Template.dwt

SURVEY LAYER NAME EXAMPLES

(Please note survey codes as table **Appendix A**):

- Example 1: Survey data is captured as SP (Staypole)

Data is downloaded using PMHC mapfile and will create layer: S ELECTRICAL

Where S Layer Prefix of survey (refer table D15.16.1)
Where ELECTRICITY Layer Group is ELECTRICITY
Note that no layer subgroup is required as code SP will produce a stay pole symbol and should be easily distinguishable from other data on the S ELECTRICITY layer (model)

- Example 2: Survey data is captured as BB6 (Note: six separate bottom of banks have been strung)

Data is downloaded using PMHC mapfile and will create layer: S DETAIL BB

Where S Layer Prefix of survey
Where DETAIL Layer Group is DETAIL
Where BB Layer subgroup of BB

- Example 3: Survey data is captured as GUM (Gum tree)

Data is downloaded using PMHC mapfile and will create layer: S VEG

Where S Layer Prefix of survey
Where VEG Layer Group is VEGETATION
Note that no layer subgroup is required as code GUM will produce a tree block

- Example 4: Survey data is captured as SRM150 (Sewer rising main of 150mm diameter)

Data is downloaded using PMHC mapfile and will create layer: S SEWER SRM

Where S Layer Prefix of survey
Where SEWER Layer Group is SEWER
Where SRM Layer subgroup of SRM

Note that the PMHC mapfile will assign a line type (SRM 150) to the 150mm diameter rising main to distinguish it from other sewer rising mains that may be in the model S SEWER SRM in 12D, however if exported to Autocad, color and linestyles are “by layer” (read from the PMHC template drawing) and the exported drawing will display a SRM line type without diameter. Manual editing will be required within Autocad to change the linestyle to SRM150.

APPENDIX A

Survey Code & Model (Layer) Names

Code	Description	Layer	Colour	PMHC Linetype
ASBT	ASBESTOS	S DETAIL	GREY(8)	Continuous
AWN	AWNING - BUILDING	S STRUCTURAL	MAGENTA (210)	Continuous
BB	BOTTOM OF BANK	S DETAIL BB	ORANGE (30)	Bottom Bank
BB1	e.g. BOTTOM OF BANK - String 1	S DETAIL BB#1	ORANGE (30)	Bottom Bank
BBQ	BBQ	S DETAIL	GREY(8)	Continuous
BDY	BOUNDARY LINES	S CADASTRE	BLUE (170)	Continuous
BH	BORE HOLE	S DETAIL	GREY(8)	Continuous
BHW	BOTTOM OF HEADWALL	S STORMWATER	GREEN (90)	Continuous
BIN	BIN	S DETAIL	GREY(8)	Continuous
BIT	BITUMEN	S ROAD BIT	CYAN (130)	Continuous
BLD	BUILDING	S STRUCTURAL	MAGENTA (210)	Continuous
BM	BENCH MARK	S SURVEY	RED (10)	Continuous
BNCH	BENCHING	S DETAIL	GREY(8)	Continuous
BOK	BACK OF KERB	S ROAD BOK	ORANGE (30)	Continuous
BOLL	BOLLARD	S DETAIL	GREY(8)	Continuous
BRDG	BRIDGE	S BRIDGE	RED (10)	Continuous
BRKW	BRICKWALL	S DETAIL	GREY(8)	Continuous
BSHLT	BUS SHELTER	S DETAIL	GREY(8)	Continuous
BUB	BUBBLER	S DETAIL	GREY(8)	Continuous
BWW	BOTTOM OF WINGWALL	S STORMWATER	GREEN (90)	Continuous
CBLK	CONCRETE BLK.	S CADASTRE	BLUE (170)	Continuous
CH	CHAINAGE e.g. CH100	S ROAD CH	DARK RED(12)	Continuous
CHEV	CHEVRONS	S LINEMARK	CYAN (130)	Continuous
CL	CENTRELINE	S ROAD CL	WHITE (7)	Centre Line
COAX	COAX CABLE LOC.	S COMMS	KHAKI (55)	Continuous
CONC	CONCRETE	S DETAIL	GREY(8)	Continuous
CONV	DRAINAGE CONVERTER	S STORMWATER	GREEN (90)	Continuous
CPORT	CAR PORT	S STRUCTURAL	MAGENTA (210)	Continuous
CRK	CREEK INVERT	S STORMWATER	GREEN (90)	Invert of Creek
CRW	CROWN OF ROAD	S ROAD CRW	MAGENTA (210)	Crown
CTRK	CENTRE OF TRACK	S DETAIL	GREY(8)	Continuous
CWAY	CYCLE WAY	S DETAIL	GREY(8)	Continuous
DAM	DAM	S DETAIL	GREY(8)	Continuous
DECK	DECK	S LANDSCAPE	GREEN (90)	Continuous
DH	DRILL HOLE	S SURVEY	RED (10)	Continuous
DHW	DRILL HOLE & WING	S CADASTRE	BLUE (170)	Continuous
DISH	DISH CROSSING	S ROAD DISH	MAGENTA (210)	Continuous
DNP	DOWN PIPE	S STORMWATER	GREEN (90)	Continuous
DRN	DRAIN	S STORMWATER	GREEN (90)	Dash

DWAY	DRIVEWAY	S ROAD DWAY	ORANGE (30)	Continuous
E	ELECTRICAL	S ELECTRICAL	ORANGE (30)	Continuous
EB	EDGE OF BITUMEN	S ROAD EB	GREY(8)	Edge Bitumen
EBOX	ELECTRICAL BOX	S ELECTRICAL	ORANGE (30)	Continuous
EG	EDGE OF GRAVEL	S ROAD EG	RED (10)	Edge Gravel
EL	EDGE LANE	S ROAD EL	WHITE (1)	Continuous
EPIL	ELECTRICITY PILLAR	S ELECTRICAL	ORANGE (30)	Continuous
EPIT	ELECTRICITY PIT	S ELECTRICAL	ORANGE (30)	Continuous
ERUN	EDGE OF RUNWAY	S ROAD ERUN	CYAN (130)	Continuous
ESTN	ELECTRICITY SUB STATION	S ELECTRICAL	ORANGE (30)	Continuous
ETAXI	EDGE OF TAXI RANK	S LINEMARK	CYAN (130)	Continuous
ETRK	EDGE OF TRACK	S DETAIL	GREY(8)	Continuous
EW	EDGE OF WATER	S DETAIL	GREY(8)	Continuous
FCE	FENCE	S DETAIL FCE	WHITE (1)	Fence
FLR	FLOOR	S STRUCTURAL	MAGENTA (210)	Continuous
GABN	GABION	S DETAIL	RED (10)	Continuous
GARD	GARDEN EDGE	S LANDSCAPE	GREEN (90)	Continuous
GAS	GAS LINE OBV	S GAS	RED (10)	Continuous
GATE	GATE	S DETAIL GATE	MAGENTA (210)	Continuous
GIN	GALV. IRON NAIL	S SURVEY	RED (10)	Continuous
GIP	GALV. IRON PIPE	S CADASTRE	BLUE (170)	Continuous
GP	GUIDE POST	S DETAIL GP	RED (10)	Continuous
GRAIL	GUARDRAIL	S DETAIL GRAIL	BLUE (170)	Guard Rail
GRAV	GRAVEL	S ROAD GRAV	GREEN (90)	Continuous
GRAVE	GRAVE	S DETAIL	GREY (8)	Continuous
GRID	CATTLE GRID	S DETAIL GRID	CYAN (130)	Continuous
GRT	GRATE	S STORMWATER GRT	GREEN (90)	Dash
GUM	GUM TREE	S VEGETATION	GREEN (90)	Continuous
HRAIL	HAND RAIL	S DETAIL HRAIL	MAGENTA (210)	Continuous
HYD	HYDRANT	S WATER	BLUE (180)	Continuous
IN	INLET	S STORMWATER IN	GREEN (90)	Dash
INV	INVERT	S STORMWATER INV	GREEN (90)	Invert
INVB	INVERT OF BOX CULVERT	S STORMWATER INVB	GREEN (90)	Culvert
INVC	INVERT OF BOX CREEK	S STORMWATER INVC	GREEN (90)	Invert of Creek
INVD	INVERT OF DRAIN	S STORMWATER INVD	GREEN (90)	Invert of Drain
INVK	INVERT OF KERB	S ROAD INVK	RED (10)	Dash Dot
INVP	INVERT OF PIPE	S STORMWATER INVP	GREEN (90)	Stormwater
INVP100	INVERT 100MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 100#2
INVP150	INVERT 150MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 150
INVP225	INVERT 225MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 225
INVP300	INVERT 300MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 300
INVP375	INVERT 375MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 375
INVP450	INVERT 450MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 450

INVP525	INVERT 525MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 525
INVP600	INVERT 600MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 600
INVP675	INVERT 675MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 675
INVP750	INVERT 750MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 750
INVP900	INVERT 900MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 900
INVP1050	INVERT 1050MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 1050
INVP1200	INVERT 1200MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW1200
INVP1350	INVERT 1350MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 1350
INVP1500	INVERT 1500MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 1500
INVP1800	INVERT 1800MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 1800
INVP2100	INVERT 2100MM STORMWATER	S STORMWATER INVP	GREEN (90)	SW 2100
KLOG	KOPPERS LOG	S DETAIL	GREY(8)	Continuous
LBOX	LETTER BOX	S DETAIL	GREY(8)	Continuous
LIGHT	LIGHT	S ELECTRICAL	ORANGE (30)	Continuous
LIP	LIP	S ROAD LIP	BLUE (170)	Continuous
LM	LINE MARKING	S LINEMARK	WHITE (1)	Continuous
LNTL	LINTEL - STORMWATER	S STORMWATER LNTL	MAGENTA (210)	Dash
LOG	LOG	S DETAIL	GREY(8)	Continuous
LP	LIGHT POLE	S ELECTRICAL	ORANGE (30)	Continuous
LYBK	LAY BACK KERB	S ROAD LYBK	ORANGE (30)	Continuous
MANG	MANGROVE TREE	S VEGETATION	GREEN (90)	Continuous
MED	MEDIAN ISLAND	S ROAD MED	CYAN (130)	Continuous
NS	NATURAL SURFACE	S DETAIL NS	Lt BLUE (140)	Continuous
OHP	OVERHEAD POWER CABLE	S ELECTRICAL OHP	ORANGE (30)	O/h Power
OPPIT	OPTICAL FIBRE CABLE PIT	S COMMS	KHAKI (55)	Continuous
OPTC	OPTICAL FIBRE - COUNCIL	S COMMS PMHC	KHAKI (55)	Optical Fibre Council
OPTO	OPTICAL FIBRE - OPTUS	S COMMS OPTUS	KHAKI (55)	Optical Fibre Optus
OPTP	OPTICAL FIBRE - PRIVATE	S COMMS OPTP	KHAKI (55)	Optical Fibre Private
OPTT	OPTICAL FIBRE - TELSTRA	S COMMS OPTT	KHAKI (55)	Optical Fibre Telstra
OPTUS	OPTUS CABLE	S COMMS	KHAKI (55)	Optus Cable
PALM	PALM TREE	S VEGETATION	GREEN (90)	Continuous
PATH	PATH	S DETAIL PATH	GREY(8)	Continuous
PAV	PAVERS	S DETAIL	GREY(8)	Continuous
PBRK	PAPERBARK TREE	S VEGETATION	GREEN (90)	Continuous
PEG	BOUNDARY PEG	S CADASTRE	BLUE (180)	Continuous
PGRD	PLAY GROUND	S DETAIL	GREY(8)	Continuous
PGRDE	PLAY GROUND EQUIPMENT	S DETAIL	GREY(8)	Continuous
PHBX	TELEPHONE BOX	S DETAIL	GREY(8)	Continuous
PINE	PINE TREE	S VEGETATION	GREEN (90)	Continuous
PIPE	DRAINAGE PIPE	S STORMWATER	GREEN (90)	Dash
PIT	STORMWATER PIT	S STORMWATER	GREEN (90)	Continuous
PM	PERMANENT MARK	S SURVEY	RED (10)	Continuous
POST	POST BOX	S DETAIL	GREY(8)	Continuous

PP	POWER POLE	S ELECTRICAL	ORANGE (30)	Continuous
RAMP	RAMP	S DETAIL	GREY(8)	Continuous
RBED	RIVER BED	S DETAIL RBED	RED (10)	Dash
RTWL	RETAINING WALL	S DETAIL RTWL	LIGHT BLUE (150)	Continuous
RWL	ROCK WALL	S DETAIL	GREY(8)	Continuous
RWLN	RAILWAY LINE	S DETAIL RAIL	LIGHT BLUE (150)	Continuous
RWM	RECLAIMED WATERMAIN	S WATER REC	PURPLE (201)	RWM
RWM100	RECLMD WATER MAIN - 100mm	S WATER REC	PURPLE (201)	RWM 100**#2**
RWM150	RECLMD WATER MAIN - 150mm	S WATER REC	PURPLE (201)	RWM 150
RWM200	RECLMD WATER MAIN - 200mm	S WATER REC	PURPLE (201)	RWM 200
RWM225	RECLMD WATER MAIN - 225mm	S WATER REC	PURPLE (201)	RWM 225
RWM250	RECLMD WATER MAIN - 250mm	S WATER REC	PURPLE (201)	RWM 250
RWM300	RECLMD WATER MAIN - 300mm	S WATER REC	PURPLE (201)	RWM 300
RWM375	RECLMD WATER MAIN - 375mm	S WATER REC	PURPLE (201)	RWM 375
RWM450	RECLMD WATER MAIN - 450mm	S WATER REC	PURPLE (201)	RWM 450
RWM525	RECLMD WATER MAIN - 525mm	S WATER REC	PURPLE (201)	RWM 525
RWM600	RECLMD WATER MAIN - 600mm	S WATER REC	PURPLE (201)	RWM 600
RWM675	RECLMD WATER MAIN - 675mm	S WATER REC	PURPLE (201)	RWM 675
RWM750	RECLMD WATER MAIN - 750mm	S WATER REC	PURPLE (201)	RWM 750
SAV	AIR VALVE -SEWER	S SEWER	BROWN (242)	Continuous
SDAV	DOUBLE AIR VALVE - SEWER	S SEWER	BROWN (242)	Continuous
SEAT	SEAT	S DETAIL	GREY(8)	Continuous
SEWER	SEWER	S SEWER	BROWN (242)	Sewermain
SFCE	SAFETY FENCE	S DETAIL SFCE	MAGENTA (210)	Continuous
SH	SHOULDER OF ROAD	S ROAD SH	WHITE (7)	Shoulder
SHRUB	SHRUB	S VEGETATION	GREEN (90)	Continuous
SIGN	SIGN POST	S SIGN	GREY(8)	Continuous
SIL	SEWER INSPECTION LID	S SEWER	BROWN (242)	Continuous
SJ	SEWER JUNCTION MARKER	S SEWER	BROWN (242)	Continuous
SM	GRAVITY SEWER LINE	S SEWER GRAV	BROWN (242)	Sewermain
SM80	GRAVITY SEWER LINE 80mm	S SEWER GRAV	BROWN (242)	SM 80**#2**
SM100	GRAVITY SEWER LINE 100mm	S SEWER GRAV	BROWN (242)	SM 100
SM150	GRAVITY SEWER LINE 150mm	S SEWER GRAV	BROWN (242)	SM 150
SM225	GRAVITY SEWER LINE 225mm	S SEWER GRAV	BROWN (242)	SM 225
SM250	GRAVITY SEWER LINE 250mm	S SEWER GRAV	BROWN (242)	SM 250
SM300	GRAVITY SEWER LINE 300mm	S SEWER GRAV	BROWN (242)	SM 300
SM375	GRAVITY SEWER LINE 375mm	S SEWER GRAV	BROWN (242)	SM 375
SM450	GRAVITY SEWER LINE 450mm	S SEWER GRAV	BROWN (242)	SM 450
SM525	GRAVITY SEWER LINE 525mm	S SEWER GRAV	BROWN (242)	SM 525
SM600	GRAVITY SEWER LINE 600mm	S SEWER GRAV	BROWN (242)	SM 600
SM675	GRAVITY SEWER LINE 675mm	S SEWER GRAV	BROWN (242)	SM 675
SM750	GRAVITY SEWER LINE 750mm	S SEWER GRAV	BROWN (242)	SM 750
SMH	SEWER MANHOLE	S SEWER	BROWN (242)	Continuous

SP	STAY POLE	S ELECTRICAL	ORANGE (30)	Continuous
SPS	SEWER PUMP STATION	S SEWER	BROWN (242)	Continuous
SRM	SEWER RISING MAIN	S SEWER SRM	BROWN (242)	SRM
SRM080	SEWER RISING MAIN - 80MM	S SEWER SRM	BROWN (242)	SRM 80**#2**
SRM100	SEWER RISING MAIN - 100MM	S SEWER SRM	BROWN (242)	SRM 100
SRM150	SEWER RISING MAIN - 150MM	S SEWER SRM	BROWN (242)	SRM 200
SRM200	SEWER RISING MAIN - 200MM	S SEWER SRM	BROWN (242)	SRM 200
SRM225	SEWER RISING MAIN - 225MM	S SEWER SRM	BROWN (242)	SRM 225
SRM250	SEWER RISING MAIN - 250MM	S SEWER SRM	BROWN (242)	SRM 250
SRM300	SEWER RISING MAIN - 300MM	S SEWER SRM	BROWN (242)	SRM 300
SRM375	SEWER RISING MAIN - 375MM	S SEWER SRM	BROWN (242)	SRM 375
SRM450	SEWER RISING MAIN - 450MM	S SEWER SRM	BROWN (242)	SRM 450
SRM525	SEWER RISING MAIN - 525MM	S SEWER SRM	BROWN (242)	SRM 525
SRM600	SEWER RISING MAIN - 600MM	S SEWER SRM	BROWN (242)	SRM 600
SRM675	SEWER RISING MAIN - 675MM	S SEWER SRM	BROWN (242)	SRM 675
SRM750	SEWER RISING MAIN - 750MM	S SEWER SRM	BROWN (242)	SRM 750
SSM	STATE SURVEY MARK	S SURVEY	RED (10)	Continuous
SSV	STOP VALVE - SEWER	S SEWER	BROWN (242)	Continuous
ST	SEPTIC TANK	S SEWER	BROWN (242)	Continuous
STAY	STAY WIRE	S ELECTRICAL	ORANGE (30)	Continuous
STEP	STEP	S DETAIL	GREY(8)	Continuous
STMP	STUMP	S VEGETATION	GREEN (90)	Continuous
STN	TRAVERSE STATION	S SURVEY STN	RED (20)	Continuous
SV	STOP VALVE	S WATER	BLUE (180)	Continuous
SWMH	STORMWATER MANHOLE	S STORMWATER	GREEN (90)	Continuous
SWV	SEWER VENT	S SEWER	BROWN (242)	Continuous
TABLE	TABLE	S DETAIL	GREY(8)	Continuous
TANK	WATER TANK	S WATER	BLUE (180)	Continuous
TAP	WATER TAP	S WATER	BLUE (180)	Continuous
TB*	TOP OF BANK	S DETAIL TB	CYAN (130)	Top of Bank
TC	TELSTRA	S COMMS	KHAKI (55)	Continuous
TCUT	TOE OF CUT	S DETAIL	GREY(8)	Continuous
TD	TABLE DRAIN	S DETAIL TD	RED (10)	Continuous
TEL	TELECOMMUNICATIONS	S COMMS	KHAKI (55)	Continuous
TELEM	TELEMETRY BOX	S COMMS	KHAKI (55)	Continuous
TFILL	TOP OF FILL	S DETAIL	GREY(8)	Continuous
THW	TOP OF HEADWALL	S STORMWATER	GREEN (90)	Continuous
TK	TOP KERB	S ROAD TK	RED (10)	Continuous
TLGT	TRAFFIC LIGHT	S DETAIL	GREY(8)	Continuous
TLINE	TREELINE	S VEGETATION	GREEN (90)	Treeline
TLT	TOILET	S STRUCTURAL	MAGENTA (210)	Continuous
TMK	TELSTRA MARKER	S COMMS	KHAKI (55)	Continuous
TOPB	TOP OF BOX CULVERT	S STORMWATER	GREEN (90)	Culvert

TOPD	TOP DRAIN	S STORMWATER	GREEN (90)	Dash
TPIL	TELSTRA PILLAR	S COMMS	KHAKI (55)	Continuous
TPIPE	TOP OF S/W PIPE	S STORMWATER	GREEN (90)	Continuous
TPIPE090	TOP OF PIPE 0.090M DIAMETER	S STORMWATER	GREEN (90)	SW 090**#2**
TPIPE100	TOP OF PIPE 0.100M DIAMETER	S STORMWATER	GREEN (90)	SW 100
TPIPE150	TOP OF PIPE 0.150M DIAMETER	S STORMWATER	GREEN (90)	SW 150
TPIPE200	TOP OF PIPE 0.200M DIAMETER	S STORMWATER	GREEN (90)	SW 200
TPIPE225	TOP OF PIPE 0.225M DIAMETER	S STORMWATER	GREEN (90)	SW 225
TPIPE250	TOP OF PIPE 0.250M DIAMETER	S STORMWATER	GREEN (90)	SW 250
TPIPE300	TOP OF PIPE 0.300M DIAMETER	S STORMWATER	GREEN (90)	SW 300
TPIPE375	TOP OF PIPE 0.375M DIAMETER	S STORMWATER	GREEN (90)	SW 375
TPIPE450	TOP OF PIPE 0.450M DIAMETER	S STORMWATER	GREEN (90)	SW 450
TPIPE525	TOP OF PIPE 0.525M DIAMETER	S STORMWATER	GREEN (90)	SW 525
TPIPE600	TOP OF PIPE 0.600M DIAMETER	S STORMWATER	GREEN (90)	SW 600
TPIPE675	TOP OF PIPE 0.675M DIAMETER	S STORMWATER	GREEN (90)	SW 675
TPIPE750	TOP OF PIPE 0.750M DIAMETER	S STORMWATER	GREEN (90)	SW 750
TPIPE900	TOP OF PIPE 0.900M DIAMETER	S STORMWATER	GREEN (90)	SW 900
TPIPE1050	TOP OF PIPE 1.050M DIAMETER	S STORMWATER	GREEN (90)	SW 1050
TPIPE1200	TOP OF PIPE 1.200M DIAMETER	S STORMWATER	GREEN (90)	SW1200
TPIPE1350	TOP OF PIPE 1.350M DIAMETER	S STORMWATER	GREEN (90)	SW 1350
TPIPE1500	TOP OF PIPE 1.500M DIAMETER	S STORMWATER	GREEN (90)	SW 1500
TPIPE1800	TOP OF PIPE 1.800M DIAMETER	S STORMWATER	GREEN (90)	SW 1800
TPIPE2100	TOP OF PIPE 2.100M DIAMETER	S STORMWATER	GREEN (90)	SW 2100
TPIT	TELSTRA PIT	S COMMS	KHAKI (55)	Continuous
TPIT6	SMALL TELSTRA PIT	S COMMS	KHAKI (55)	Continuous
TPL	TELSTRA POLE	S COMMS	KHAKI (55)	Continuous
TR	TREE	S VEGETATION	GREEN (90)	Continuous
TRK	TRACK	S DETAIL	GREY(8)	Continuous
UGE	UNDERGROUND ELECTRICITY	S ELECTRICAL UGE	ORANGE (30)	UGE
VER	VERANDAH	S STRUCTURAL	MAGENTA (210)	Continuous
VLVE	WATER VALVE	S WATER	BLUE (180)	Continuous
VPIT	VALVE PIT	S WATER	BLUE (180)	Continuous
WALL	WALL	S DETAIL	GREY(8)	Continuous
WAV	AIR VALVE - WATER	S WATER	BLUE (180)	Continuous
WDAV	DOUBLE AIR VALVE - WATER	S WATER	BLUE (180)	Continuous
WHF	WHARF	S DETAIL	GREY(8)	Continuous
WM	WATERMAIN	S WATER OBVMAIN	BLUE (180)	Watermain
WM100	WATER MAIN - 100mm	S WATER OBVMAIN	BLUE (180)	WM 100**#2**
WM150	WATER MAIN - 150mm	S WATER OBVMAIN	BLUE (180)	WM 150
WM200	WATER MAIN - 200mm	S WATER OBVMAIN	BLUE (180)	WM 200
WM225	WATER MAIN - 225mm	S WATER OBVMAIN	BLUE (180)	WM 225
WM250	WATER MAIN - 250mm	S WATER OBVMAIN	BLUE (180)	WM 250
WM300	WATER MAIN - 300mm	S WATER OBVMAIN	BLUE (180)	WM 300

WM375	WATER MAIN - 375mm	S WATER OBVMAIN	BLUE (180)	WM 375
WM450	WATER MAIN - 450mm	S WATER OBVMAIN	BLUE (180)	WM 450
WM525	WATER MAIN - 525mm	S WATER OBVMAIN	BLUE (180)	WM 525
WM600	WATER MAIN - 600mm	S WATER OBVMAIN	BLUE (180)	WM 600
WM750	WATER MAIN - 750mm	S WATER OBVMAIN	BLUE (180)	WM 750
WMTR	WATER METER	S WATER	BLUE (180)	Continuous
WPS	WATER PUMP STATION	S WATER	BLUE (180)	Continuous
WS	WATER SERVICE	S WATER	BLUE (180)	Continuous
WSCV	SCOUR VALVE - WATER	S WATER	BLUE (180)	Continuous
XDPIT	WAX - DRAINAGE PIT	W STORM PIT	GREEN (90)	Continuous
XGUT	WAX - INVERT OF GUTTER	W ROAD INVGUT	GREY (251)	Continuous
XHYD	WAX - HYDRANT	W WATER HYD	BLUE (180)	Continuous
XIL	WAX - INTERALOTMENT DRAIN	W STORM INTDRN	GREEN (90)	Continuous
XINV	WAX - INVERT LEVEL	W STORMWATER	GREEN (90)	Continuous
XNS	WAX - NATURAL SURFACE	W DETAIL NS	MAGENTA (210)	Continuous
XSMH	WAX - SEWER MANHOLE	W SEWER SMH	BROWN (242)	Continuous
XSV	WAX - STOP VALVE	W WATER SV	BLUE (180)	Continuous
XTK	WAX - TOP OF KERB	W ROAD TK	GREY (252)	Continuous

Notes

#1 Common string names may be given a string number during the survey as per common practice but should be downloaded to the one layer. E.g. BB1, BB2 and BB3 would be downloaded to S DETAIL BB.

#2 Linestyles for varying pipe sizes may need to be manually changed in Autocad following export from 12D.

APPENDIX B
Application of Paper Space and Model Space

1. All plans produced in AutoCAD are to use Paperspace and model space
2. The data or model is inserted in model space at true coordinates
3. The layout (or paperspace) is to be used for plan sheets
4. The Viewport should only be inserted on the viewport layer. The viewport is a (scaled) view of the plan information. (Like looking through a window at a subset of data)
5. If a UCS is required to fit the plan to the viewport (i.e.: plan rotated to suit) than a descriptive name shall be given to the UCS used in the viewport (e.g.: sheet1)

Method for use of Model / Paper Space

6. Open new drawing using PMHC AutoCAD template. (This will include the A1 title block with a viewport.
7. Click on model tab.
8. Select layer 0 (or XREF layer)
9. Insert (OR Xref) the required drawing(s) at true coordinates.
10. Click back on the Layout1 tab
11. Click PAPER on the AutoCAD tray at the bottom of the screen. (This should now say MODEL and the cross hairs should only be visible within the view port.
12. Zoom Extents
13. Zoom to the area to be shown

To create the requires UCS (Rotate the plot window)

14. Draw a line parallel to the direction you want to be horizontal on the plan
15. Select Tools>new UCS>Object and select the drawn line
16. Tools> Named UCS (to bring up the UCS Dialog)
17. Select the “unnamed”, Right click and rename to the sheet number “sheet01”
    a. Settings> tick “update view to plan when UCS is changed.
    b. OK to exit the dialog box
18. Reselect Tools> Named UCS (to bring up the UCS Dialog)
19. Select “World” >set current & OK to exit
20. Reselect Tools> Named UCS (to bring up the UCS Dialog)
21. Select the new UCS “sheet01” set current & OK to exit
22. The Plan should now be rotated to the desired angle.

To set the Scale

23. zoom to the required area
24. click MODEL on the AutoCAD tray at the bottom of the screen. (this should now say PAPER and the cross hairs should be visible within the entire drawing area.
25. Click on the viewport border
26. Select Viewport in the properties dialog box
27. SCALE = 1000 / (Custom Scale)
    EG: if a scale of 1:500 is required the custom scale = 1000/500=2 OR 2:1 in the standard scale box.

To add additional viewports

28. Select the viewport layer
29. View > Viewports > 1 Viewport and select the required area on the screen & return to step 11.

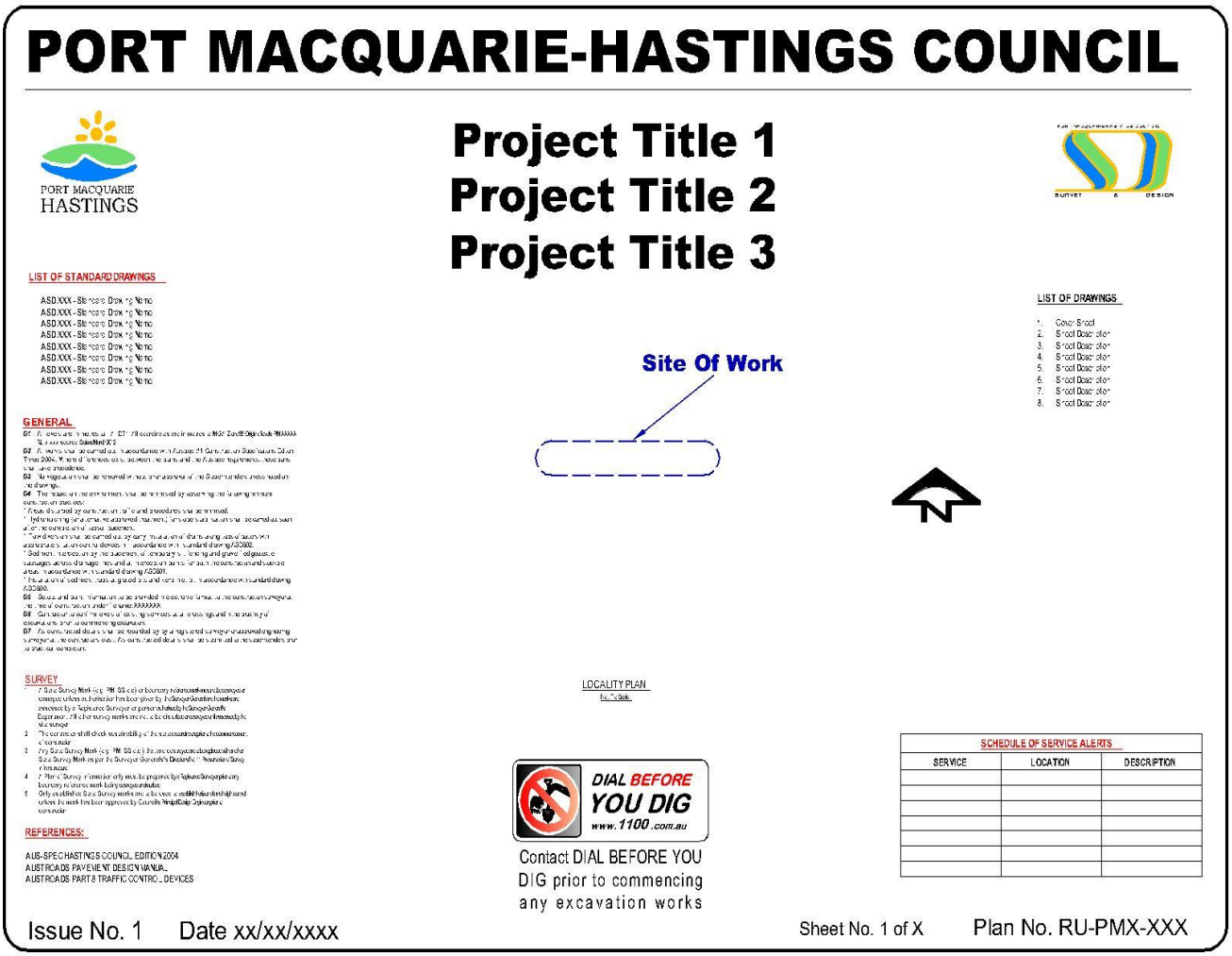
APPENDIX C
LIST OF STANDARD BLOCK WITH ATTRIBUTES

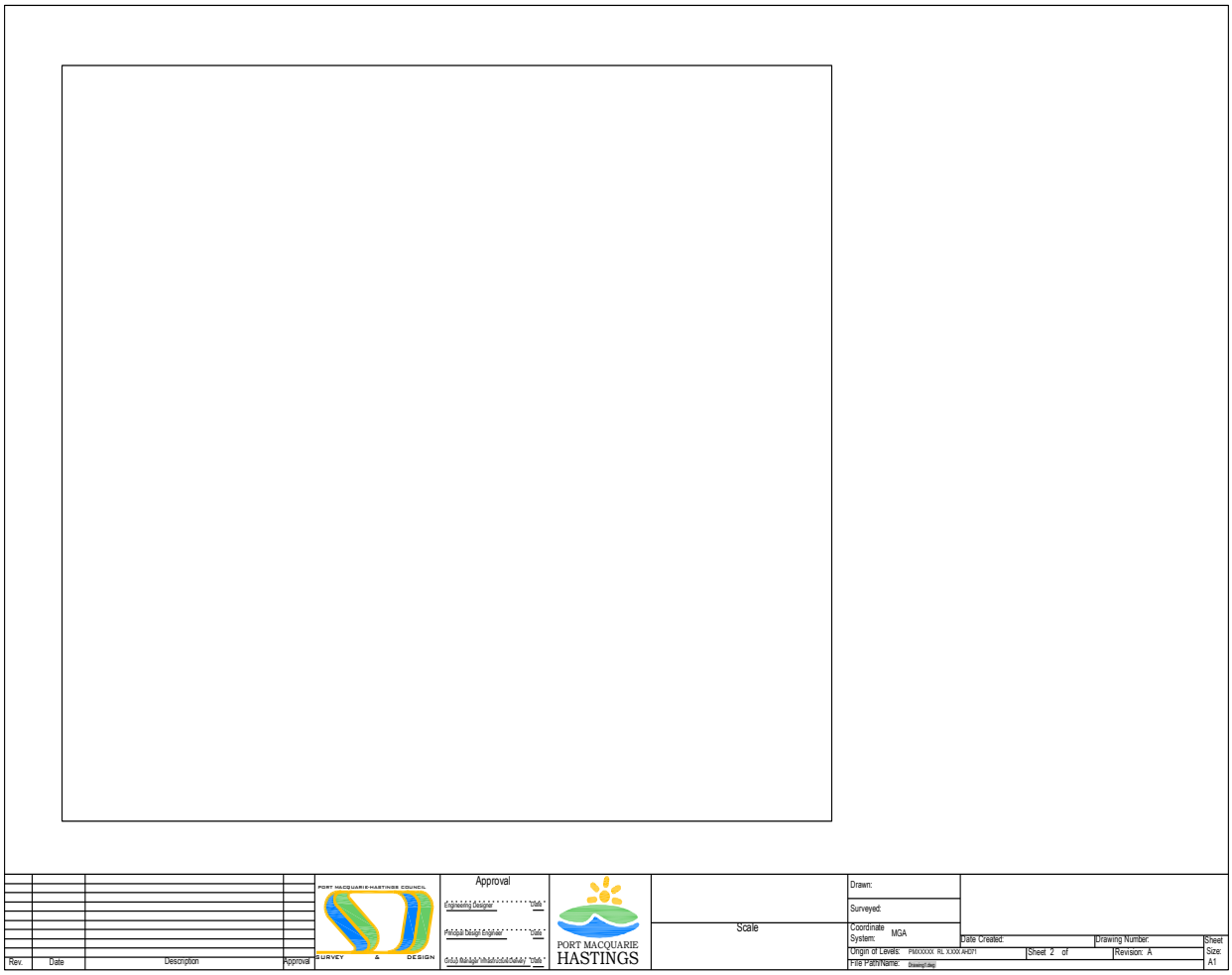
Block Name	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Attribute 5	Attribute 6	Attribute 7	Attribute 8	Attribute 9	Attribute 10	Attribute 11	Attribute 12
AIRVALVE	FITTING_TYPE	SIZE	SURFACE_LEVEL	DEPTH_TO_TOP_MAIN	CONSTRUCT_DATE	CONSTRUCT_BY						
BBQ	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
BNET	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
BRDGE	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
CNET	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
CRICK	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
FISH	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
GPOST	CONSTRUCT_DATE	ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY							
HYDRANT	FITTING_TYPE	SURFACE_LEVEL	DEPTH_TO_TOP_MAIN	CONSTRUCT_DATE	CONSTRUCT_BY	DEPTH_TO_TOP_LUGS	MAKE_OF_FITTING	MODEL_OF_FITTING				
JUNCT	CONSTRUCT_DATE	CONSTRUCT_BY	DIST_D/S_MH	DEPTH	RISER	SIDELINE	SIDELINE_(M)	ANGLE				
LBIN	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
LIGHT	CONSTRUCT_DATE	CONSTRUCT_BY	ASSET_TYPE	MANUFACTURER	LIGHT_TYPE	GLOBE						
PGRND	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
PSEAT	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
PTABLE	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
RWALL	CONSTRUCT_DATE	CONSTRUCT_BY	ASSET_TYPE	MATERIAL	LENGTH							
SBORD	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
SCOUR	FITTING_TYPE	SIZE	SURFACE_LEVEL	DEPTH_TO_TOP_MAIN	CONSTRUCT_DATE	CONSTRUCT_BY						
SEWPIPE	CONSTRUCT_DATE	CONSTRUCT_BY	PIPE_CLASS	PIPE_LENGTH	D/S_INVT	PIPE_TYPE	DIA	LINE_NO	U/S_INVT			
SEWPSTN	CONSTRUCT_DATE	CONSTRUCT_BY	WELL_BOT	DESIGN_BWL	DESIGN_TWL	PIPE_INVT	LID_LEVEL	WELL				
SHELT	CONSTRUCT_DATE		ASSET_TYPE	MANUFACTURER	MODEL	INSTALL_BY						
SMH	CONSTRUCT_DATE	RL_INVERT	STEP_IRONS	CONSTRUCTED_BY	MANHOLE_NO.	RL_TOP_OF_LID						
SPUMP	MAKE_PUMP	MODEL_PUMP	DUTY_PT	SERIAL								
SRFITT	CONSTRUCT_DATE	CONSTRUCT_BY	DEPTH	MATERIAL	FITTING	CHAINAGE						
SRPIPE	MATERIAL	LENGTH	PIPE_CLASS	PIPE_DIA	AV_DPTH							
LCS31	CONSTRUCT_DATE											
STEPS	CONSTRUCT_DATE	CONSTRUCT_BY	ASSET_TYPE	MATERIAL	LENGTH							
SVALVE	FITTING_TYPE	SURFACE_LEVEL	DEPTH_TO_TOP_MAIN	CONSTRUCT_DATE	CONSTRUCT_BY	DEPTH_TO_TOP_LUGS	MAKE_OF_FITTING	MODEL_OF_FITTING				
SWPP1	LENGTH	DIA	SUBCATCH	CONDUIT_NO	D/S_LINE_NO	D/S_PIT_NO	D/S_INV_RL	U/S_LINE_NO	U/S_PIT_NO	U/S_INV_RL	WIDTH	HGT
SWPT1	LINE_NO	SUBCATCH	NODE	ASSET_DTL	R_L_TOP	INV_RL	CAPACITY	AREA				
WBEND	FITTING_TYPE	SIZE	SURFACE_LEVEL	DEPTH_TO_TOP_MAIN	CONSTRUCT_DATE	CONSTRUCT_BY						
WPIPE	CONSTRUCT_DATE	CONSTRUCT_BY	DEPTH	MATERIAL	DIAMETER	CLASS	DISTANCE_FITTINGS	OFFSET_BDY	TRENCHSTOPS	BULKHEAD		
WTAPER	FITTING_TYPE	SIZE	SURFACE_LEVEL	DEPTH_TO_TOP_MAIN	CONSTRUCT_DATE	CONSTRUCT_BY						
WTEE	FITTING_TYPE	SIZE	SURFACE_LEVEL	DEPTH_TO_TOP_MAIN	CONSTRUCT_DATE	CONSTRUCT_BY						

APPENDIX D - Standard Title Block and Cover Sheet

The standard plotting sheet sizes shall be A1 & A3. A standard A1 border shall be used for both sizes, with printing scale reduced to half for A3.

The PMHC Title block is available for all outsourced design plans and a separate modified title block is available for private works.




Approval
Engineering Designer
Date
Principal Design Engineer
Date
Date
PORT MACQUARIE
HASTINGS
Scale
Drawn:
Surveyed:
Coordinate System: MGA
Origin of Levels: PMXXXXX RL XXXX AHD?
Date Created:
Drawing Number:
Sheet
Sheet 2 of
Revision: A
Size:
A1
File Path\Name:
Rev.
Date
Description
Approved

APPENDIX E - Plot Settings (CTB files)

Use of CTB files is plotter independent. Each pen represents a plot pen thickness. When plotting to A3 check the 'Scale Line weights' tick box in the plot screen window. Suggested CTB Setup

AutoCAD Colour Number	Colour		PMHC Mono.ctb Plot Colour	PMHC Colour.ctb Plot Colour	Pen Thinkness (mm)
1	Red		Black	10	0.50
2	Yellow		Black	Black	0.35
3	Green		Black	80	1
4	Cyan		Black	130	0.70
5	Blue		Black	170	0.50
6	Magenta		Black	210	0.18
7	Black		Black	Black	0.25
8	Dark grey		By colour	By Colour	0.25
9	Light grey		By colour	By Colour	0.25
255	255		Black	Black	0.25
10 to 254	others		By colour	By Colour	0.25
COLORS USED IN SURVEY					
10	Red (Variant)		Grey	By Colour	0.25
30	Orange (Variant)		Grey	By Colour	0.25
90	Green (Variant)		Grey	By Colour	0.25
130	Cyan (Variant)		Grey	By Colour	0.25
170	Blue (Variant)		Grey	By Colour	0.25
210	Magenta (Variant)		Grey	By Colour	0.25
251	Dark grey		By colour	By Colour	0.25

APPENDIX F - Template Drawing

(Refer Auspec D15 downloads available on councils website)

Councils template drawing contains common design layers by prefix and group (e.g. D ROAD, D COMMUNICATIONS), survey layers (e.g. S STORMWATER LNTL) and works as executed layers (e.g. W ROAD TK) with colour and linestyles and also includes commonly used blocks.

Numerous additional layer sub group may be created following the process as discussed in section D15.16. For example, common layer names that may be created could include:
D ROAD LIP, D ROAD CL, D POWER UGE etc.

The AutoCAD purge command may be used within AutoCAD to erase unused layers.

APPENDIX G - Works As Executed Cad Presentation

(a) Plan Presentation

The Developer, Designer, responsible Council Officer or Contract Supervisor will be required to submit electronically prepared CAD (Computer Aided Drafting) plans in accordance with **AS 1100** and using a standard symbol feature library.

Standard Symbols

The symbol feature library will provide miscellaneous features such as Hydrants, Stop valves, Headwalls, etc. along with an attribute dialog box that will be used in the preparation of a Work-as-Executed plan after completion of any work under contract.

Attribute Dialog Box

When the symbol feature (Block) is imported into a drawing an Attribute Dialog Box will appear for which the required information shall be added against the provided headings. After this information has been added only the symbol feature will visually appear on the plan with the Attribute information appearing as a NGR (Non Graphical Representation). See Figures 2 & 3 below.

(b) Abbreviations for Attribute Information

Below is a list of abbreviations for attribute information to be entered for Asset items.

1. Stormwater Structures - (Nodes)

The following abbreviations are to be used when entering the information for Surface Detail within the Attribute Box for a Node.

Kerb Inlet only Pits

Kerb Inlet Only Pits – Abbreviations

Pit Type	*Abbreviation (Surface Detail)*
1.20m Kerb Inlet	KI1.2M
1.80m Kerb Inlet	KI1.8M
2.40m Kerb Inlet	KI2.4M
3.00m Kerb Inlet	KI3.0M
4.00m Kerb Inlet	KI4.0M

Kerb Inlet and Grate only Pits

Kerb Inlet & Grate Only Pits- Abbreviations

Pit Type	*Abbreviation (Surface Detail)*
1.20m Kerb Inlet & Grate	KIG1.2M
1.80m Kerb Inlet & Grate	KIG1.8M
2.40m Kerb Inlet & Grate	KIG2.4M
3.00m Kerb Inlet & Grate	KIG3.0M
4.00m Kerb Inlet & Grate	KIG4.0M

Miscellaneous Pits

Miscellaneous Pits – Abbreviations

Pit Type	*Abbreviation (Surface Detail)*
Pipe Outlet No Headwall	1P
Blind Pit	BLPT
Converter (Old Drainage)	CONV
Grate Only	GRT
Junction Pit	JPT
Surface Inlet Pit	SIP

Concrete Headwalls

Concrete Headwalls – Abbreviations

Pipe Diameter	*Abbreviation (Surface Detail)*
300mm Ø Concrete Headwall	HDW300
375mm Ø Concrete Headwall	HDW375
450mm Ø Concrete Headwall	HDW450
525mm Ø Concrete Headwall	HDW525
600mm Ø Concrete Headwall	HDW600
750mm Ø Concrete Headwall	HDW750
900mm Ø Concrete Headwall	HDW900
1050mm Ø Concrete Headwall	HDW1050
1200mm Ø Concrete Headwall	HDW1200
1350mm Ø Concrete Headwall	HDW1350
1500mm Ø Concrete Headwall	HDW1500
1800mm Ø Concrete Headwall	HDW1800
2100mm Ø Concrete Headwall	HDW210

Miscellaneous Drainage Structures

Miscellaneous Drainage Structures – Abbreviations

Structure Type	*Abbreviation (Surface Detail)*
Gross Pollutant Trap	GPT
Dry Detention Basin	DDTN
Wet Detention Basin	WDTN
Trash Rack	TSRCK

2. Stormwater Pipes - (Conduits)

Pipe Class

To be entered by using either Class X, Y and Z or Class 2, 3 and 4.

Pipe Class – Abbreviations

Pipe Material

Pipe Materials – Abbreviations

Pipe Material Type	*Abbreviation (Surface Detail)*
Concrete Pipe	CONC
Steel Pipe (Galv., Corrugated)	STL
Ribbed UPVC	RPVC

3. Signs and Support Structures

Signs and their supporting structures are to be placed in one (1) of the five (5) following groups.

Signs & Supporting Structures – Abbreviations

a. Large signs with structures that support the signage above the traffic lanes.
b. Large signs supported on structures located on the roadside. Typically the structures are fabricated using larger structural steel components.
c. Medium sized signs with modular support structures that cantilever the signage above the pedestrian areas (footways).
d. Medium sized signs and multiple smaller signs supported on more than one (1) pipe post.
e. Signs supported on a single pipe post.

All standard signs used will be catalogued using the Australian Standard for signs, "Road Signs Specification" - AS1743 and grouped into one (1) of the following categories:-

Regulatory Signs	(R)
Warning Signs	(W)
Guide Signs	(G and GE)
Hazard Markers	(D)

Signs that are Non - Standard, (i.e. those that are not listed in the "Road Signs Specification") will be grouped as :-

Non - Standard Signs (NS)

4. Linemarking

Linemarking will be entered using one (1) of the two (2) following groups, Longitudinal Linemarking or Transverse Linemarking.

(i) Longitudinal Linemarking Abbreviations

For example, Separation, Barrier, Lane, Edge, Median Outline and Continuity Lines are to be entered for the group of Longitudinal Linemarking using the following abbreviations:-

Longitudinal Linemarking – Abbreviations

Description (Line Type)	*Line Type Abbreviation*
Separation Line on 2 lane roads	S1
Separation Line on multi lane roads	S2
Double Barrier Line on all roads	BB
Single Barrier Line on all roads	BS
Left hand Edge Line general roads	E1
Right hand Edge Line on divided carriageway	E3
Outline of Painted Medians	E5
Applied to Incline Face of Median Kerb	E6
Defines turning path at a complex intersection	T1
Lane Line on multi lane road	L1
Lane Line on multi lane road	L2
Lane Line on multi lane road	L3
Exit Lane Line on multilane roundabouts	L4
Defines edge of through carriageway adjacent to turning lane, freeway ramp, bus bay and start or	

finish of auxiliary lane	C1
Kerbside linemarking for Clearway restrictions	C2
Kerbside linemarking for No Stopping restrictions	C3

(ii) Transverse Linemarking Abbreviations

For example, Hold Lines, Pedestrian Crossings, Zig Zag Warning Lines, Chevron Infill, Arrows, Speed Zone Numbers, Bike Logos, Railway Crossings and Disabled Logos are to be entered for the group of Transverse Linemarking using the following abbreviations:-

Transverse Linemarking – Abbreviations

Description (Line Type)	*Line Type Abbreviation*
Give Way Hold Line 200mm R.H.S.	TB2
Give Way Hold Line 300mm L.H.S.	TB3
Give Way Hold Line for R`abouts 400mm	TB4
Stop Line Hold Line 200mm R.H.S.	TF2
Stop Line Hold Line 300mm L.H.S.	TF3
Pedestrian Crossing (3.60m x 0.45m)	PDX
Zig Zag Warning Line	ZZ
Chevron Island / Median Fill	CHEV
Straight Arrow	UA1
Double Turn Arrow	UA2
Turn Arrow	UA3
Straight / Turn Arrow	UA4
Merge Arrow	UA5
Straight / Double Turn Arrow	UA6
Rural Straight Arrow	RA1
Rural Turn Arrow	RA2
60km/h Numerals	60K
80km/h Numerals	80K
100km/h Numerals	100K
Small Bike Logo	BIKS
Large Bike Logo	BIKL
Rail Crossing - Railway Warning	RAX
Disabled 900mm Logo	DIS

(a)(iv) Plan Preparation - Survey Symbols

The following list of survey symbols along with the accompanying attribute box information are to be used in the compilation of plans by the Developer, responsible Council Officer, Designer or Contract Supervisor.

Stormwater Drainage

Stormwater Drainage – Survey Symbols

Survey Symbol	*Description*
	Kerb Inlet, Kerb Inlet & Grate (Nodes).
	Pipe Outlet No Headwall, Blind Pit, Convertor (Old Drainage), Grate Only, Junction Pit and Surface Inlet Pit (Nodes).
	Concrete Headwalls (Nodes).
	Gross Pollutant Traps (Nodes).
	Wet & Dry Detention Basins (Nodes).
	Stormwater Pipes (Conduits)

Water Reticulation

Water

Reticulation – Survey Symbols

Survey Symbol	*Description*
	Water Hydrants
	Water Stop Valves
	Bends
	Tapers
	Tees
	Air Valves
	Water Scour Valves
	Water Mains
	Water Services

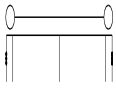
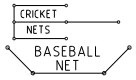
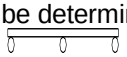
Sewerage System

Sewerage System – Survey Symbols

Survey Symbol	*Description*
	Sewer Manholes
	Sewer Junction / Side lines
	Sewer Gravity Mains
	Sewer Pump Stations
	Sewer Pump Information
	Sewer Rising Main Fittings (Air Valves, Scour Valves, Bends)
	Sewer Rising Mains

Parks and Reserves

Parks & Reserves – Survey Symbols

Survey Symbol	*Description*
Individual Items	
	Park Seats
	Litter Bins
	Bar - b - ques
	Boardwalk Bridges
	Picnic Tables
	Shelters
	Playground
	Scoreboard
	Fish Cleaning Tables
	Goal Posts
	Cricket Pitches
(to be determined)	Monuments
(to be determined)	Flagposts
	Nets - Cricket Practice - Baseball
(to be determined)	Signage
(to be determined)	Fencing
	Retaining Walls
	Steps
(to be determined)	Ramps

Lighting

General Items

Pathways
Paving
Turfing
Gardens
Plant Material
Amenities

Underground Utilities

(to be determined)	Electricity Cables
(Use Water Reticulation Symbols)	Water Mains / Services
(to be determined)	Irrigation
(to be determined)	Telstra / Optus Cables
(Use Stormwater Drainage Symbols)	Stormwater Drainage

Parks and Reserves

Survey Symbol	*Description*
	Signs & Signposts

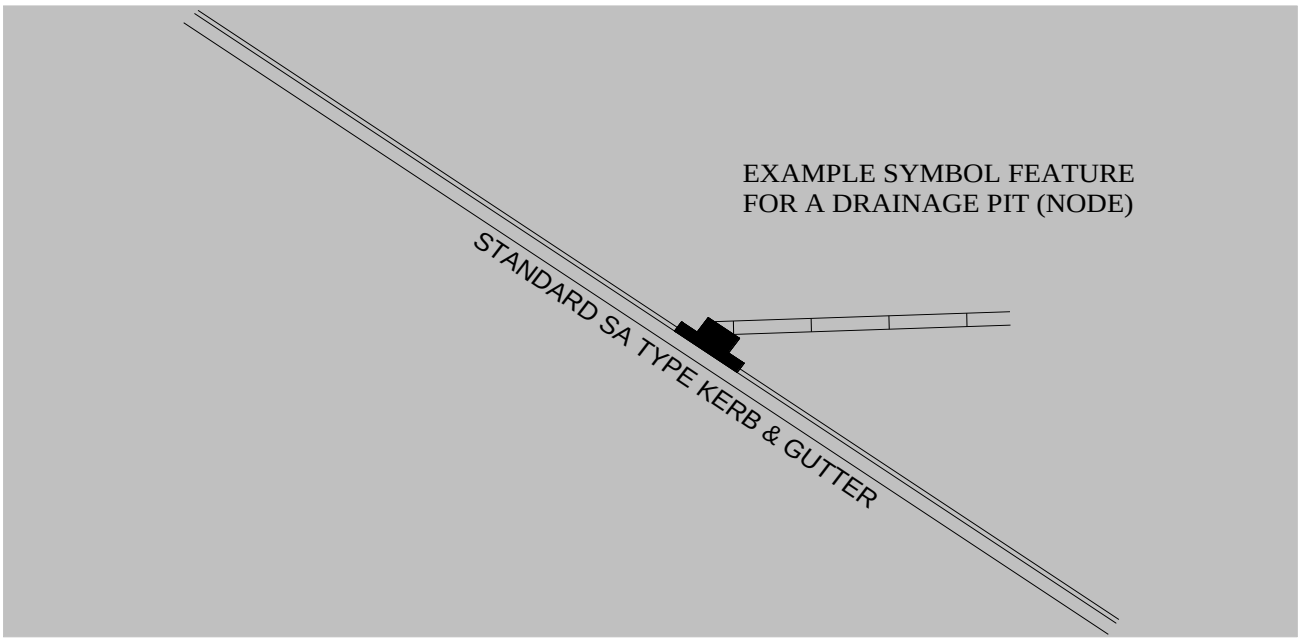


Figure 2. Example of a Symbol Feature for a Drainage Pit (Node) prepared in AutoCAD