



Government of **Western Australia**
North Metropolitan Health Service



NMHS – COMPUTER AIDED DESIGN & DRAFTING GUIDELINES AND STANDARDS MANUAL



ISSUE VERSION

Document Title:	NMHS CADD Guidelines and Standards Manual		
Prepared by: (Title):	Krina Barot (Document Controller)	Doc Version No.	1
Reviewed by: (Title):	Peter Easson (Area Director Facilities Management)	Review Date:	19 November 2019
Endorsed By: (Title):	Peter Easson (Area Director Facilities Management)	Endorsed Date:	19 November 2019

Version Number	Revision Item	Issue Date
1	First Release of NMHS CADD Guidelines and Standards Manual	November 2019



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DEFINITIONS

NMHS	North Metropolitan Health Service
AIA	American Institute of Architects
AEC	Architecture Engineering & Construction
CAD	Computer Aided Design
CADD	Computer Aided Design & Drafting
BIM	Building Information Modelling
Model	Building Information Model
FM	Facilities Management
XREF	AutoCAD External Reference drawing
Drawing Types	
Tender Design Drawings	Used for tender purposes
As Constructed Drawings	Final Working drawings at end of contract to As Built status
Facilities Management Drawings	Derived from As Constructed drawing and Used for the NMHS FM system (and reflects current status). Refer Appendix D

NMHS Contact Details

For further information please contact:

Drawing Office

Facilities Management, North Metropolitan Health Service

QEII Medical Centre, Level 1 R Block, Verdun Street, NEDLANDS WA 6009

T: (08) 6457 2314 E: NMHS.Drawingoffice@health.wa.gov.au

Electronic documents and associated templates can be located at www.nmahs.health.wa.gov.au/Downloads



INTRODUCTION

The NMHS is responsible for capital and maintenance works across its infrastructure portfolio. A works project may encompass refurbishment of an existing health facility, or construction of a new building/facility. Minor capital and maintenance works are managed directly by NMHS; while major capital works are managed through the Department of Finance Building Management and Works on behalf of the NMHS.

The delivery of standardised format Computer Aided Design (CAD) documentation including 'Tender', 'As Constructed' and 'Facilities Asset Management' drawing sets enables ongoing management and maintenance of NMHS facilities after completion of the works.

Requirement for this guideline and Standard

The NMHS CADD Documentation Guideline and Standards (the Standards) forms a part of the NMHS requirement for maintaining NMHS' records and is included within the NMHS Supplementary Preliminary Specifications as part of the contractual deliverables from third parties entering a works contract with NMHS or their representative.

Techniques and methods used by Consultants and Contractors to produce Design, For Construction and As-Constructed documentation can vary from the requirements outlined in these Standards, however, CAD drawings and BIM models issued as Tender and As Constructed sets, must conform to the following NMHS Standards.

Legislative Requirements

The State Records Act 2000 requires all government records of the NMHS to be managed in accordance with the Western Australia 'State Records Commission endorsed NMHS Record Keeping Plan', and the NMHS authorised internal 'Record Keeping Management Policy'. This includes records created from Outsourced functions and under the definition of a record as "any record of information however recorded and includes: (c) a drawing". **CAD drawing formats are thereby included.**

This guideline serves to meet the NMHS' legislative obligation to retain State Archive Records and all Consultants and Contractors are required to comply with the Act on behalf of NMHS.

Further information on the State Records Act 2000 and the State Records Commission Standards can be located at <http://www.sro.wa.gov.au/state-recordkeeping/recordkeeping-policies-and-standards>.

Use of CAD and BIM for ongoing Building Management at NMHS

NMHS CAD drawings and building models may be used for a variety of purposes including:

- Integration with the facilities management system (FM System) for daily management, operation and reporting of NMHS building assets.
- Operational asset and site services management
- Strategic planning for building alterations/additions associated with minor and major capital works;
- Operational Maintenance drafting requirements.

NMHS utilises AutoCAD drawings and Revit based building models as the drafting platform. AutoCAD drawings are integrated into the FM System utilised to manage and operate NMHS buildings and workplace and to provide accurate space and asset information.



Retrieval

Copies of existing drawings are provided to Consultants and Contractors for information and as a template for new design projects and maintenance of facilities records. These Standards ensure that all drawings produced for NMHS are in consistent formats that are easy to retrieve. It is essential that all NMHS drawing records are current, accurate, and stored in their recoverable and editable native format.



DELIVERABLES – CHECKLISTS, TEMPLATES AND COMPLIANCE

Consultants and Contractors engaged on behalf of NMHS shall supply as part of their deliverables the CADD Drawing Checklist, and CADD Drawing Information sheet. These are available for download online at www.nmahs.health.wa.gov.au/Downloads/. Completed copies shall be supplied to the NMHS Representative on digital storage device together with the set(s) of drawings. It is the Consultant’s and Contractor’s responsibility to check regularly for updates to any CADD related data. This information supplied to NMHS should be current and accurate for ease of retrieval.

CADD Drawing Checklist

Complete and sign the checklist to signify compliance with the NMHS requirements.

All drawings must be supplied on Digital storage device and in the prescribed format.

All digital storage devices shall be scanned for virus infections prior to issue to the NMHS.

Drawing Information Sheets

A separate CADD Drawing Information Sheet must be supplied for each digital storage device, complete with all information.

CAD Templates

The following file types and sheet sizes shall be used by the AEC consultants and contractors. Template files are available on line at www.nmahs.health.wa.gov.au/Downloads

File	Description
A1base.DWG	<p>A1 size (841 x 594) base drawing with title block with standard text.</p> <p>All drawings shall be produced using only A1 size sheets utilising the standard A1 size the NMHS base drawing sheet incorporating the border, logo and title block layout.</p>
Cover.DWG	<p>A1 size cover drawing with title block with standard text.</p> <p>This is to be used by all Consultants (including Sub-Consultants) and Contractors in their documentation.</p> <p>Logos are to be inserted in the area provided at the base of the cover sheet title block.</p> <p>The cover sheet shall show an index of all drawings provided in the set.</p> <p>A NOTE: NO logos are to appear above the State Government Crest.</p>

Note:

For use of different sheet sizes please contact the NMHS - CAD Officer-Documents Controller for approval.



Requirements for handover of CAD documentation

The Consultant and/or Contractor shall supply the following documents to the Principal's Representative at the end of practical completion.

1 copy of CAD documentation of "**As Constructed**" drawings on separate digital storage device in the format of:

- 1 x 'AutoCAD' (.DWG) and
- 1 x 'Revit' (.RVT) if available and
- 1 x PDF and
- 1 x legible hard copy of "As Constructed" drawings as part of the Operations & Maintenance manual.

1 copy of CAD documentation of "**Facilities Management**" drawings on separate digital storage device in the format of:

- 1 x 'AutoCAD' (.DWG) and
- 1 x 'Revit' (.RVT) if available and
- 1 x PDF

NOTE:

CAD drawings must be provided in the above electronic formats on Digital storage device.

ALL CAD drawings and Building Models are to be clearly labelled so they reflect their type, for example, 'AS CONSTRUCTED' or 'FACILITIES MANAGEMENT' drawings.

Where NMHS master Architectural Floor Plans and Services Plans have been provided by NMHS to the Consultant and/or Contractor, it shall be the responsibility of the Consultant and/or Contractor, to update those master plans in line with the requirements of this document and return to NMHS.

Not all drawings supplied, will fully comply with this document. It shall be the responsibility of the Consultant and/or Contractor to update these drawings, and comply with the current NMHS CADD Documentation Guideline and Standards, before handover back to NMHS.



TRANSMISSION OF CAD DATA

Provision of PDF's to NMHS

General

PDF drawing files are to be delivered to the NMHS Representative on digital storage device. The ability to produce PDF files (portable document format) is available via either a direct 'save' from AutoCAD to PDF format, or the "Plot" function in AutoCAD.

PDF File Naming

PDF shall follow the file naming conventions as detailed in the [APPENDIX B](#).

PDF Delivery Requirements

Supply ALL files to the NMHS in a compressed ZIP file format using WinZip or equivalent.

NMHS requires individual files be no larger than 4.0mb in size.

All PDFs to appear in black and white unless otherwise specified.

Zip files can be delivered to the NMHS on Digital storage device such as a USB thumb drive or CD.

The method of electronic file transfer should be confirmed with the Project Representative prior to delivery.

All files created must be viewed by the NMHS Representative to ensure that they open correctly, prior to delivery to the NMHS.

Zip file names shall be in the format of project title + discipline

Example:

QEIIIMC – SCGH A-Block architectural drawings zip;

QEIIIMC – SCGH A-Block mechanical drawings zip, etc.

If more than one zip file is required for a discipline then they shall be numbered as such.

Example:

QEIIIMC – SCGH A-Block architectural drawings1 zip.

QEIIIMC – SCGH A-Block architectural drawings2 zip,

If the project has only a limited number of drawings and they are of small size, then they can be compressed into a single zip file. For example:

QEIIIMC – SCGH A-Block drawings zip.

Provision of CAD data to NMHS

Currently the NMHS operates AutoCAD 2017. Consultants and Contractors are to ensure that their CAD system can produce electronic copies of the drawings in a format compatible to a minimum of AutoCAD 2010.



Where another CAD system is used, it shall be the responsibility of the Consultant and Contractor to supply drawings to the NMHS to a minimum format of AutoCAD 2010 .DWG only.

No raster images shall be included in the data delivered to NMHS.

No manual updating of CAD drawings is allowed.

The supply of “As Constructed” CAD drawings to the NMHS remains the responsibility of the Consultant and Contractor.

Provision of CAD Drawings from NMHS

NMHS will supply copies of available CAD drawings where the project involves work to an existing facility or is a copy of an existing facility. Drawings will be supplied in an AutoCAD “.DWG” format only. These drawings will be available from the NMHS Representative. Where NMHS master Architectural Floor Plans and Services Plans have been provided by NMHS to the Consultant or Contractor, it shall be the responsibility of the Consultant or Contractor, to update those master plans in line with the requirements of this document and return to NMHS.

AutoCAD Drawing Deliverables

NMHS requires all CAD files supplied for handover to be error-free, to be transmitted using the ‘**E-Transmit**’ function in AutoCAD, and to include all external referenced drawings (Xref), and related files. CAD files are to be fully compliant with all of the standards outlined here in this manual. Significant loss of drawing entities or project data that result from contractor’s CAD file translation procedures, will not be accepted.



CAD DRAFTING STANDARDS

PDF Standards

Requirements

Refer to [APPENDIX B](#): File Naming Conventions.

AutoCAD drawing limits are to be set at the bottom left corner of the sheet at 0, 0, – to the top right corner of the sheet, before publishing to PDF.

Final drawings are to be ‘zoomed’ to limits, before publishing to PDF and handover to the NMHS Drawing Office. This ensures that all files will appear the same size when viewed.

Only one floor plan drawing is to be contained per PDF file. (The number of PDF files supplied must be equal to the number of CAD DWGs and/or hard copy drawings of the Project.)

All entities outside the drawing boundaries are to be erased.

The Grid toggle is to be turned off.

Non-standard fonts are not to be used.

The delivery of PDF files, is in addition to the requirement for all Consultants and Contractors to supply AutoCAD DWG’s (‘As Constructed’ DWG’s) as stated under “Provision of Data to the NMHS.”

All AutoCAD PDF files supplied to the NMHS will be identical in content to the corresponding source DWG, AutoCAD and hard copy drawing supplied.

CAD Standards

AutoCAD Drawing - File Naming Conventions

Refer to [APPENDIX B](#): File Naming Conventions.

Drawing standards requirements

NOTE: NMHS drawings will be based on the requirements in this document and the AutoCAD template drawings provided, containing NMHS’s - AutoCAD variables settings.

Line Properties

Final drawing line work must be delivered as follows:

Line Weight (mm)	Colour No	Colour
0.18	1	RED
0.25	2	YELLOW
0.35	3	GREEN
0.50	4	CYAN
0.18	5	BLUE
0.70	6	MAGENTA
1.00	7	WHITE



Line Weight (mm)	Colour No	Colour
0.13	8	GREY
0.15	9	
0.25	10	
0.35	11	
0.50	12	
0.25	13	
0.70	14	
1.00	15	

Colour by layer or line type is equally acceptable but discipline must be maintained to ensure that only one method is used in the production of drawings.

A Single colour can be used for all entities on layer XREF.

Line types generally are continuous with grid lines drawn in a CENTRE line type and items to be removed in a DASHED line type.

A minimum line weight plot thickness of 0.13mm is to be used on all drawings.

Units

The system variable 'MEASUREMENT' shall be set to 1 for Metric, and Units set to Millimetres.

Lettering

Due to copyright laws, all lettering for standard drafting documentation shall be AutoCAD standard font file ISOCP2 vertical, plain, uncondensed, to minimum text height of 2mm with a 0.25mm thickness. All text shall be UPPERCASE only.

Drawing Scale

All drawings shall be drawn at FULL SIZE. Under no circumstances is a drawing to be scaled unless it is an INSERTED BLOCK.

The scale of the final drawing, (which determines the initial insertion of the BASE drawing) is to reflect the smallest scale drawing on the sheet. For example, if the drawing is a 1:20 section with 1:5 details, the 1:20 section takes precedence for the plot scale. Dimscale shall be set to drawing scale.

Drawing Title Block and Cover Sheet

Refer to APPENDIX A: Title Block and Cover Sheet for example of the Title Block and Cover Sheet.

Detailed titles for each drawing shall be determined in discussion with the 'Principal's Representative' and shall be consistently applied throughout, regardless of discipline.

Titles for cover sheets shall be consistent with drawing title block and shall be consistently applied throughout, regardless of discipline. The cover sheet shall have a drawing index.



Electronic documents and associated templates can be located at www.nmahs.health.wa.gov.au/Downloads

Model Space / Paper Space

All drawings, unless otherwise discussed with the NMHS shall be delivered as a 2D drawing file using only Model Space.

There will be no tiled view ports used in model space.

Consultants and/or Contractors may use 'Paper Space' throughout the creation of the drawings, and through the 'Tender' and 'As Constructed' phases, however final drawings handed over to NMHS for records and used for the Facilities Management requirements, must conform to this NMHS 'CADD Documentation Guideline and Standards' Manual.

The NMHS acknowledges the use of Model Space and Paper Space however NMHS requires final delivery of CAD drawings in Model Space for ongoing operational use, records requirement and use in their FM System.

- All drawings need to be submitted in a standard format to comply with state records requirements and for retrieval, as well as NMHS ongoing maintenance purposes in operations and in perpetuity.
- The NMHS Facilities Management System standardises linking AutoCAD drawings with all data in Model Space. Use of paper space will require prior approval from NMHS Drawing Office.
- These CADD standards and Policies are intended to be generic enough for all types of CADD systems, and so as to ensure equity to all applicable consultancy firms regardless of the CADD application they are running, however all drawings supplied to NMHS are to be handed over in native AutoCAD format.

Blocks

- Standard blocks of commonly used fixtures and furniture are available from the NMHS Drawing Office on request for use with NMHS projects.
- Blocks shall be created (with entities created on layer 0), using colour BYBLOCK and line type BYBLOCK. This will permit flexibility with colour and line types. Blocks shall follow the naming convention as detailed in the **APPENDIX B**.

Symbols

Refer to the relevant Australian Standards Association publications.

Purging

All unused layers, line types, text styles etc. are to be purged from the drawing.

Limits



The limits are to be set to the correct sheet size, with the origin (BASE) set bottom left hand corner set to 0,0.

Layers

All layers are to be turned on where practical. Each discipline is to delete all layers not applicable to them.

In AutoCAD, in the layering dialogue box, no layers are to be turned off for plotting.

Entities outside Drawing Borders

All entities outside the drawing borders are to be erased.

Orientation

Orientation of all plans and parts of plans are such that the NORTH POINT points to the top of the sheet where possible.

Amendments

Amendments to drawings shall be marked and NOTED in the amendment and title blocks.

Letters shall be used for tender documentation amendments and numerals shall be used for post tender – 'For Construction' and 'As-Constructed' handover documentation and 'Facilities Management' CAD amendments.

CAD Layer Standards

This standard is designed to ensure the NMHS and all users including its future Consultants and/or Contractors are able to easily retrieve relevant information. The usage of this layering system serves to ensure that other Consultants and/or Contractors using original documents are easily able to identify entities from the existing drawings.

Layers used by NMHS

NMHS employs a commonly used and industry accepted layer naming standard and use rules recommended by the 'CAD Layer Guidelines' published by the American Institute of Architects (AIA). Where noted, NMHS has supplemented the guidelines with its own rules and standards, as necessary.

NOTE: For Design and Construct drawings, Colour and Linetype by Layer and/or by Entity is acceptable.

Refer to APPENDIX F: Layer Standards for details of layer naming convention.

External Referencing (Drawing Xref)

The methodology of producing drawings using the Xref or XCLIP command of AutoCAD is acceptable.

The "PATH" for the Xref file shall be set to default to the current working directory.

The XREF drawing file(s) will use the drawing naming conventions in this document and Shall Not be bound into the main drawing file.



NOTE: All Xref's shall contain only the layers required. All layers not required, shall be deleted/purged from the drawing.

It is acceptable to use unmodified drawings for external referencing. However, where the drawing is modified in any way prior to its use as an external reference the drawing must be named with the X prefix to distinguish it from the original drawing.

All external reference files used in drawings shall be inserted on the XREF layer.

Facilities Management drawings - Space Polylines requirements

Refer to APPENDIX D: Facilities Management drawings for details for FM drawings Xref structure and polylining requirements.

Australian Drawing Standards - References

Drawings shall meet the requirements of the Australian Standard drafting codes detailed below.

AS 1100101-1992	Technical Drawing	General Principles
AS 1100 201-1992	Technical Drawing	Mechanical Drawing
AS 1100 301-2008	Technical Drawing	Architectural Drawing
AS 1100 401-1984	Technical Drawing	Engineering Survey, Engineer Survey/Design Drawings
AS/NZS 1100 501-2002	Technical Drawing	Structural Engineering Drawings
AS 3883-1991	Computer Graphics	Computer Aided Design (CAD) – Guide for Structuring of Computer Graphic Information

Refer to APPENDIX E: Project Phase – CAD Standards and Requirements.



APPENDIX A: Title Block and Cover Sheet

example of design information table to go on drawing S1
STRUCTURAL drawings only

DESIGN INFORMATION	
DEAD AND LIVE LOADS AS1170.1-1989	
LIVE LOAD – BLOCK A, MEZZANINE	5 kPa
LIVE LOAD – BLOCK B CONCRETE ROOF (NON TRAFFICABLE)	1.5 kPa
WIND LOADS	
WIND REGION	A
WIND FROM NORTH EAST AND SOUTH EAST	TERRAIN CATEGORY 2 SHIELDING MULTIPLIER 1 TOPOGRAPHIC MULTIPLIER 1 IMPORTANCE MULTIPLIER 1
WIND FROM NORTH WEST AND SOUTH WEST	TERRAIN CATEGORY 3 SHIELDING MULTIPLIER 0.9 TOPOGRAPHIC MULTIPLIER 1 IMPORTANCE MULTIPLIER 1
EARTHQUAKE LOADS AS 1170.4-1993-AMDT.1	
STRUCTURE TYPE	11
ACCELERATION COEFFICIENT	0.14
SITE FACTOR	1.25
SOIL BEARING PRESSURES	
ALL FOOTINGS (SAFE BEARING PRESSURE)	3 kPa
SITE CLASSIFICATION	M

REV	DATE	AMMENDMENTS	BY	APP.

DOCUMENTATION BY:
Advanced Spatial technologies
21 Rowe Ave. Rivervale Perth WA



Government of Western Australia
North Metropolitan Health Service

DISCIPLINE

SITE LOCATION

TITLE 1

TITLE 2

TITLE 3

DRAWN INITS	DESIGNED INITS	REDUCTION
CHECKED INITS	PRINCIPAL	0 25
APPROVED INITS	SIGNATURE	
SCALE 1:1	DATE 2-Oct-19	DRAWING No. REV
PROJECT TRIM FILE No. FILE NO.	NMHS PROJECT REF No. PROJ REF NO.	SS-BFFDxxx A

THIS IS A CADD DRAWING
DO NOT AMEND MANUALLY

NMHS\BASE

12:26:53 PM

2-Oct-19

Where:

SS – Site Code
D – Discipline

B – Block Code
xxx – Drawing number

FF – Floor Code



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PROJECT NAME TITLE TITLE	YEAR	
DISCIPLINE		
SET No.	TENDER NUMBER	VOL. OF
DOCUMENTATION BY: NAME OF CONSULTANT PRACTICE ADDRESS OF CONSULTANT PRACTICE		

Note: *Diagram not to scale.*

The cover sheet shall show an index of all drawings provided in the set.



APPENDIX B: File Naming Conventions

PDF Drawings - File Naming Convention

PDF file name should follow the same CAD drawing file naming convention (refer drawing file naming convention), such that the CAD file name and PDF file name are identical.

AutoCAD Drawings - File Naming Conventions

NOTE: NO special characters are to be used in the file name (e.g.: &, /, \) as this can cause file viewing problems and no revision prefix (e.g.: _1, -A) in the file name.

It is acceptable to use unmodified drawings for external referencing. However, where the drawing is modified in any way prior to its use as an external reference the drawing must be named with the X prefix to distinguish it from the original drawing.

Building Floor Plans

All Drawing files must be constructed in accordance with the following convention. The use of drawing numbers shall also follow this convention, such that the drawing number and file name are identical. When constructing file names, the next available “consecutive drawing number” shall be obtained from the NMHS CAD Officer, E: NMHS.Drawingoffice@health.wa.gov.au

Category 1

Identify the NMHS **SITE** Code. Refer to APPENDIX C: NMHS Site Codes - For example:

GR	Graylands Hospital
OS	Osborne Park Hospital
KE	King Edward Memorial Hospital
QE	Queen Elizabeth II Medical Centre

Category 2

Identify the Building **BLOCK** Code. For example:

A – Z	A to Z Block
-------	--------------

Category 3

Identify the **FLOOR** or Level and must use the following characters as applicable.

SB	Sub Basement
B	Basement
G	Ground
LG	Lower Ground
MZ	Mezzanine
C	Civil/Car Park and/or Survey
01	Level 1
02	Level 2
03	Level 3
04	Level 4
R	Roof



-	Multi Floor (refer note)
---	--------------------------

Note: Drawings not specific to a floor level shall have the floor level reference replaced with a dash “-“ Such drawings may include sections, elevations & schematics.

Category 4

Identify the Practice or DISCIPLINE and must use the following characters as applicable.

A	Architectural (include interior fitout)
E	Electrical (include disciplines: Security, Information Communications & Technology, Telecommunications and Vertical Transportation)
ED	Evacuation Diagram
F	Fire Protection
M	Mechanical
ME	Mechanical Electrical
MG	Medical Gases
P	Plumbing (Hydraulic)
S	Structural
X	Xref Drawing (refer NOTE:)

Note: Any discipline or service outside the building type drawing that is not included in Cat. 4 can follow the site services discipline code and naming convention. E.g. Landscape, Irrigation etc.

Category 5

Identify the Consecutive Drawing **NUMBER** in 3 digit format.

For example: 001 through to 999 = drawing number 1 to 999.

NOTE: Architectural drawings with increment 001 for each level are reserved for NMHS master base plans.

Typical Examples: for QEIMC Hospital Site

1. Electrical Services for Ground Floor of A Block = **QE-AGE001**

Site ID	Building ID	Floor/Level ID	Discipline ID	Drawing Number
QE	A	G	E	001

2. Mechanical Services for 5th Floor of G Block = **QE-G05M012**

Site ID	Building ID	Floor/Level ID	Discipline ID	Drawing Number
QE	G	05	M	012



3. Mechanical Electrical Services for Multi Floor of HH Block = **QE-HH-ME102**

Site ID	Building ID	Floor/Level ID	Discipline ID	Drawing Number
QE	HH	-	ME	102

Site Services Plans

Category 1

Identify the NMHS **SITE Code**. Refer to APPENDIX C: NMHS Site Codes - For example:

GR	Graylands Hospital
OS	Osborne Park Hospital
KE	King Edward Memorial Hospital
QE	Queen Elizabeth II Medical Centre

Category 2

Identify the Site Services ID.

SS	Site Services Drawing
SST	Site Services Tunnel

Category 3

Identify the Practice or **DISCIPLINE** and must use the following characters as applicable.

A	Architectural
E	Electrical (include disciplines: Security, Information Communications & Technology, Telecommunications and Vertical Transportation)
IR	Irrigation and/or Grounds Reticulation
L	Landscaping
F	Fire Protection
M	Mechanical
ME	Mechanical Electrical
MG	Medical Gases
P	Plumbing (Hydraulic)
S	Structural
C	Civil and/or Carpark
X	Xref Drawing (refer NOTE:)

Category 4

Identify the Consecutive Drawing **NUMBER** in 3 digit format.

For example: 001 through to 999 = drawing number 1 to 999.

Note: Architectural drawings with increment 001 for each Site are reserved for NMHS Master Site plans.



Typical Examples

1. Electrical Site Services for Graylands Hospital = **GR-SSE002**

Site ID	Site Services ID	Discipline ID	Drawing Number
GR	SS	E	002

2. Plumbing Site Services for King Edward Memorial Hospital = **KE-SSP102**

Site ID	Site Services ID	Discipline ID	Drawing Number
KE	SS	P	102

3. Mechanical Site Services for Osborne Park Hospital = **OS-SSM012**

Site ID	Site Services ID	Discipline ID	Drawing Number
OS	SS	M	012

Block naming convention

Block file names shall be constructed as followings:

- 1 Character 1 identifies the Discipline.
 - A - Architectural
 - E - Electrical
 - I - Interior Fitout (Furniture)
 - F - Fire Protection
 - IR - Irrigation/Grounds Reticulation
 - L - Landscape
 - M - Mechanical
 - P - Plumbing
 - S - Structural
- 2 Character 2-6 identifies the Name.
 - e.g. CHAIR.
- 3 Character 7-8 identifies the Number.
 - e.g. 01- Block number 1
 - 02- Block number 2
- 4 Example: ACHAIR01

A	C	H	A	I	R	0	1
----------	----------	----------	----------	----------	----------	----------	----------



APPENDIX C: NMHS Site Codes

Site/Facility Code	Site/Facility Description
QE	Queen Elizabeth II Medical Centre
GR	Graylands Hospital
OS	Osborne Park Hospital
SL	Selby Lodge – Lemnos St
ST	Family Pathways / CAMHS – Stubbs Tce
KE	King Edward Memorial Hospital
ROK	Subiaco Lower West Mental Health – Rokeby Rd
SAL	Youth Axis – Salvado Rd
SQC	Shenton Park Quadriplegic Centre – Selby St
JAM	Clinical Intervention CCI / Youth link – James St
HAW	Hawthorn House Hospital - Flinders St
SUC	Youth Reach South / Office – Wentworth Pde
MUR	MH Court Diversion (Forensic MH) – Murray St
JOO	ICAY Mental Health Services – Grand Blvd
JHC	Joondalup Adult Community MH (V block) / Joondalup Adult MH Clinic (M block)
MIR	Mirrabooka Community Mental Health Service – Chesterfield Rd
BME	Osborne Park Biomedical Engineering – Walters Dr
HIL	Hillarys Child & Adolescent MH Endeavour House – Endeavour Rd
SPE	Spearwood Child Development – Lancaster St
RHE	State Child Development Centre – Rheola St
WAR	Warwick Child & Community Health & Dental
MOR	Morley Dental Clinic - Russell St



APPENDIX D: Facilities Management drawings

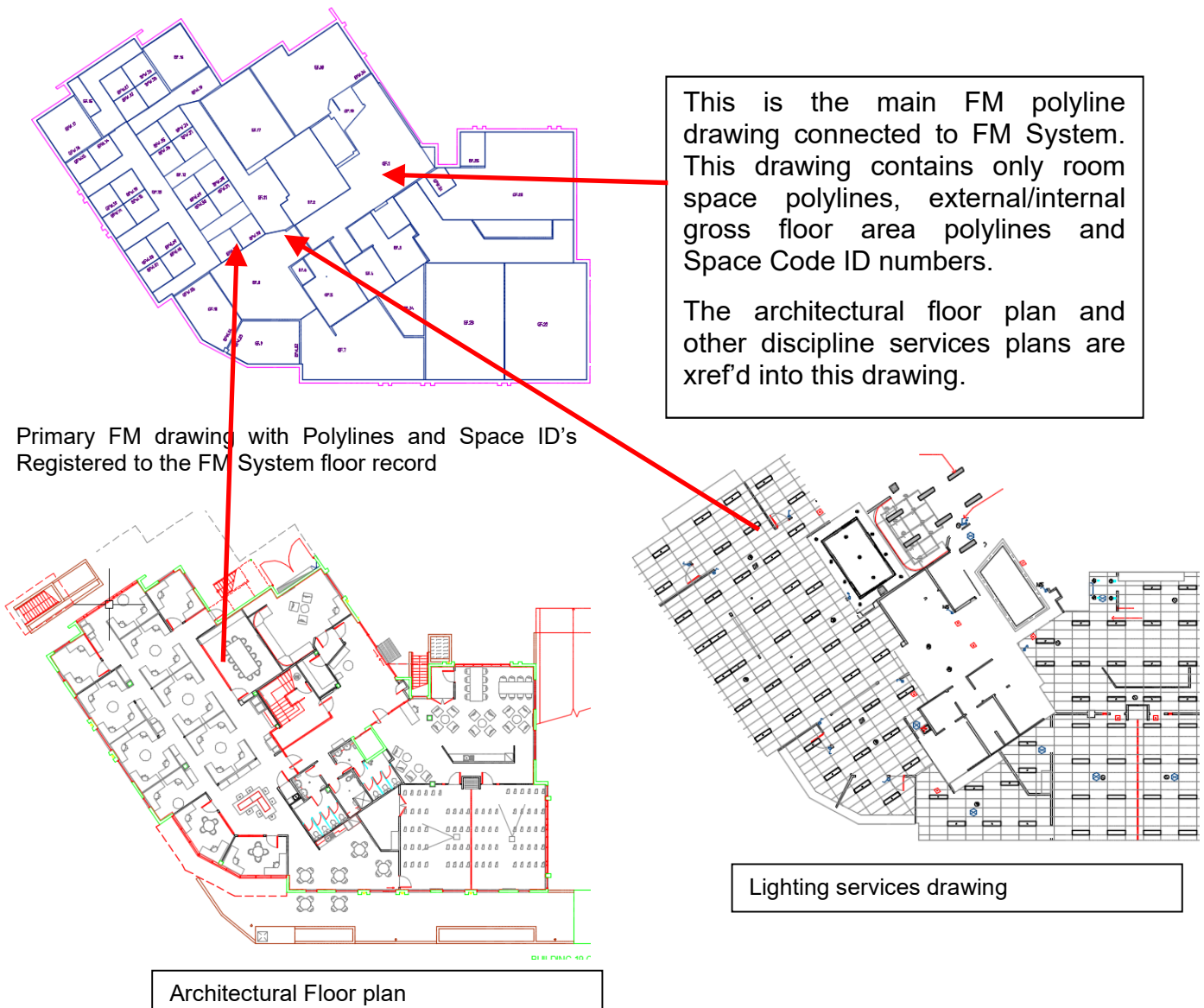
Floor plan and services drawings are held and maintained by NMHS for purpose of managing the existing NMHS facilities. These drawings represent current status, and new works As Constructed drawings are used as a source for these drawings. The drawings are linked to the Facilities Management system to provide accurate information on the facilities for all users across NMHS.

Floor Plan External Drawing Reference (Xref) Structure

For the Facilities Management System used by NMHS, a base FM polyline drawing is used for space linking, and automatic area base calculations. The Architectural floor plan and other service discipline drawings are Xref'd into the base polyline drawing.

This section provides the Xref structure and 3rd parties carrying out work for these drawings are required to maintain the CAD standards protocol, polylining methodology, and xref structure before handing back to NMHS.

Example.





Drawing Xreference Name (Floor Plans)

Rename Xref 'Reference Name' in floor plans as follows:

Reference Name	Status	Size	Type	Date	Saved Path
B61UD	Opened	67.3 KB	Current	6/3/2015 3:49:34 ...	
ARCH	Loaded	201 KB	Overlay	6/3/2015 1:42:25\Master\B61a.dwg
ELEC	Loaded	388 KB	Overlay	5/25/2015 2:35:17\Master\B61e.dwg
FIRE	Loaded	55.4 KB	Overlay	5/25/2015 2:37:44\Master\B61FA.dwg
MECH	Loaded	847 KB	Overlay	6/3/2015 2:21:50\Master\B61h.dwg
PLUM	Loaded	144 KB	Overlay	6/3/2015 3:26:05\Master\B61p.dwg
UTIL	Loaded	151 KB	Overlay	6/3/2015 2:19:33\Master\B61u.dwg

This will standardise the prefix of Xref layer names, across all floor plan drawings used in the FM Systems and significantly reduce the number layers used.

Example

Filters	S...	Name	On	Freeze	L...	Colo
All		0	☑	☑	8	8
All Used Layers		A-ANNO-PATT	☑	☑	2	2
Xref		A-AREA	☑	☑	w	w
		A-AREA-EMPL	☑	☑	w	w
		A-AREA-GROUP	☑	☑	w	w
	☑	A-AREA-IDEN	☑	☑	2	2
		A-AREA-NOTE	☑	☑	w	w
		A-AREA-RMNM	☑	☑	w	w
		A-AREA-TYPE	☑	☑	w	w
		A-EVAC	☑	☑	re	re
		ARCH A-EXST-ARCH-TEXT	☑	☑	re	re
		ARCH A-EXST-BLDG-LABL	☑	☑	re	re
		ARCH A-EXST-CLMN-BUBB	☑	☑	3	3
		ARCH A-EXST-CLMN-LINE	☑	☑	g	g

Facilities Management drawings - Space Polylines requirements

Requirement to Polylining spaces/rooms

NMHS requires final floor plans submitted to have all room/spaces polylined for their facilities management system, to define space/room areas and to track space across their entire buildings portfolio. Ensure that both CAD documents of completed projects and Facilities Management CAD drawings have all room spaces polylined at handover.

Floor plan space/room polylines

- ALL spaces on a floor must be defined by a polyline and are tracked within the FM System. Including primary and secondary circulation, elevator lobbies, and other spaces such as stores, etc.
- All space polylines used to define spaces for the FM System must be on the AutoCAD 'A-AREA' layer, and drawn with a Z value of 0, Colour 5, with a width of 0.



- Space Polylines shall be drawn to the face of the wall, and around columns.
- No other entities should be drawn on the 'A-AREA' layer. Please ensure all construction lines drawn on the A-AREA layer are removed.
- Space polylines should not overlap, as spaces may be double counted.
- No defined space polyline should go outside of the Interior Gross polyline.
- Any space on a floor not defined by a polyline will be automatically counted as “secondary circulation.”
- The FM System requires that each space defined by a polyline must have one (and only one) room ID/tag/number (space code ID). The FM System tags each space automatically and uses the room space number. The Consultant and/or Contractor shall place the room number in a clear central location inside the room space, so the system will find the number for that space.
- Non-assigned areas such as circulation, stores etc, are prorated automatically based upon the space type/proration code assigned to each space.
- In open office areas – each workstation shall have its own space Polyline.

Exterior / Interior Polylines

The FM System requires an “Exterior Gross” polyline that should trace the outside edge of the building structure.

It also requires an “Interior Gross” polyline that should trace the inside edge of the building structure. The path of the Interior Gross polyline should follow the client standards.

The Interior Gross polyline must be completely contained within the Exterior Gross polyline. The difference between the Exterior and Interior gross areas represents space lost to building walls.

- External Gross Polylines will be drawn on Layer A-AREA-EG, Colour 9, with a width of 0.
- Internal Gross Polylines will be drawn on Layer A-AREA-IG, Colour 8, with a width of 0.
- Colour and Linetype 'ByLayer', with a width of 0.

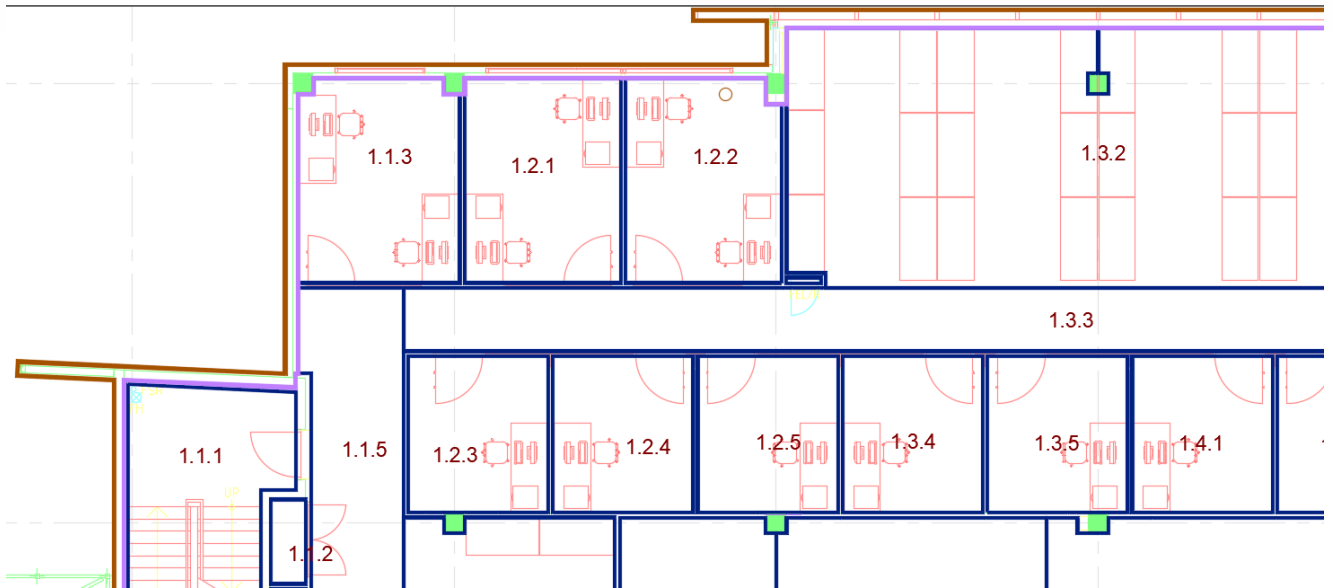


Fig. Typical Floor Plan and space polylines

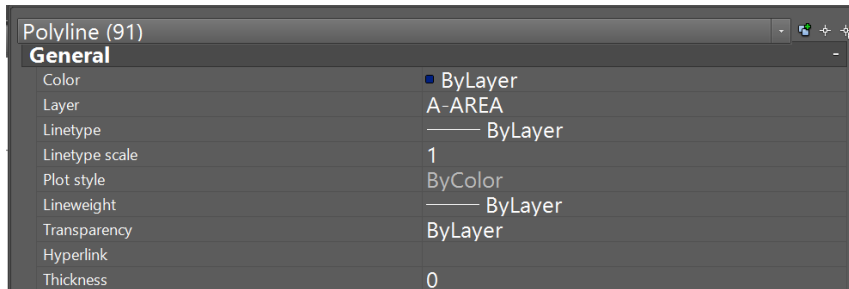


Fig. Space Polyline properties



APPENDIX E: Project Phase – CAD Standards and Requirements

Existing Buildings – Alterations and Additions

Note: This section applies only to practical completion documentation for alterations or additions to existing buildings.

The purpose of this document is to outline the minimum requirements for the preparation of drawings, so that a high-quality uniform set of documents can be achieved and maintained for all NMHS facilities. This section details what Consultants and/or Contractors must supply at Practical Completion and for 'As Constructed' drawings for the Project.

Refer to DELIVERABLES – CHECKLISTS, TEMPLATES AND COMPLIANCE for handover of documents at Practical Completion and As Constructed drawings requirements.

Layering, colours, naming standards, etc. are to comply with the overall *NMHS CADD Documentation Guideline and Standards Manual* as contractual deliverables.

The NMHS will supply copies of CAD drawings (where available and requested) where the project involves work to an existing facility. Drawings will be supplied in an AutoCAD "DWG" format only, by the NMHS Drawing Office. Where NMHS master Architectural Floor Plans and Services Plans have been provided by NMHS for an awarded project to the Consultant and/or Contractor, it shall be the responsibility of the Consultant and/or Contractor, to update those master plans in line with the requirements of this document and return to NMHS.



Architectural Drawings:

Architectural drawings shall incorporate the following information:

Site Plans

Site plan to include the following:

- All buildings (outlines).
- Car parks, roads, paths etc.
- Retaining walls.
- Bollards.
- Pergolas, screens, courtyards, Pits etc.

Site plans shall also show adequate description of buildings (e.g. main hospital - Block A), site boundaries, street names, etc. North point should always be shown. Floor plans and Site plans should be oriented so that North points to the top of the sheet where possible.

All site plans are to:

- Be drawn in model space.
- Have a Scale 1:1 (mm).
- Be Geospatially located and oriented (using existing grid line system).
- Have Units set to millimetres (drawing must not be 'unitless').
- Have no use of multiple paper space tabs.
- Have each floor plan/s inserted in its correct spatial location and relationship to other building floor plans.
- Have no layers 'frozen' or turned 'off'.
- Layout space can be used with an appropriate viewport scale for printing purposes (1:200, 1:500, 1:1000).

The following layers shall remain. All other layers are to be removed from the site plan.

- The Title block and drawing sheet
- The North point
- Contour lines, Levels
- The New Building Outline
- The Existing Building Outline
- All roads or car parks
- All car bays
- All paths, ramps etc.
- All physical features (fences, trees, bollards, goal posts, retaining walls, stairs, kerbs, external lights etc.)



- Any visible components of 'In-Ground' services (manholes, pits etc.)
Site service mains from building boundary to entry point into new buildings are to be shown on the site plan.

Note: *All unused layers, line types, text styles etc. are to be purged from the drawing.*

Grid Identification

- Vertical grids – use **Numeric** (1 to 10...) – progressing left to right
- Horizontal grids – use **Alphabet** (A to Z) – progressing top to bottom

All Intellectual property rights and ownership of all CAD drawings and Building Models resides with the Principal in accordance with the contract agreement and Copyright Act 1968.

Floor Plans

Floor plans to show all fixtures and fittings to each room/space including major mobile equipment. In particular, the following to be shown and noted:

- Cupboards, basins, W.C. pans, slop hoppers etc.
- Fire Compartmentation /smoke barriers (shown dotted).
- Pergolas, courtyards, paths, roadways etc.
- Eaves Line (shown dash-dot).
- Room Names & Numbers.

If the above fixtures and fittings are not shown on NMHS supplied floor plans, then the information should be gathered from site inspection and included. For large projects that require several sheets, a small location plan is to be provided above the title block that locates the area detailed in relation to the overall plan layout including the Block identification key.

All floor plans are to:

- Have 1 floor plan per drawing file.
- Be drawn in model space
- Show complete building floor plans (no breaks).
- Have no use of multiple paper space tabs.
- Be drawn at 1:1mm and then Geospatially located and oriented (using existing grid line system).
- Have Units set to millimetres (drawing must not be 'unitless').
- Have no layers 'frozen' or turned 'off'.
- Layout space can be used with an appropriate viewport scale for printing purposes (1:50 or 1:100).

The layers to remain are those containing:



- The Title block and drawing sheet
- Walls
- Windows
- Doors
- Room names
- Room numbers
- Floor finishes
- Any fixed furniture
- Columns (concrete or steel columns)
- Any plumbing fixture (basins, toilets and urinals)

Note: *All unused layers, line types, text styles etc. are to be purged from the drawing.*

Room Numbering

- Room numbers shall be provided for every room.
- A room is any enclosed space including ducts.
- Room numbers shall be prefixed with letters or numbers denoting floor level and numbers denoting space location in relation to the grid line.
- For example:
 - Basement = B.1.1, B.2.15
 - Ground floor = G.11.5, G.20.6
 - First floor = 1.1.2, 1.4.5 etc.
- Where the floor plan drawing has a grid, the room numbering shall commence from the top left-hand corner of the structure (i.e. NW corner) and progress to the right, and then return to next lower room on the left. Where the floor plan drawing does not have a grid, the room numbering shall be sequential from the top left of the plan progressing left to right (where possible progressing sequentially along corridors) and finishing in the bottom right hand corner of the plan.
- Corridor numbers apply between partitioning doors.
- Where a facility incorporates more than one building, they shall be given differing block identification.
- **Grid Identification**
 - Vertical grids – use **Numeric** (1 to 10...) – progressing left to right
 - Horizontal grids – use **Alphabet** (A to Z) – progressing top to bottom

The Consultant and/or Contractor is to provide to NMHS a marked-up print of the proposed room numbering for approval. Once checked, room numbers can be applied to the final drawing.



The Consultant and/or Contractor should consider the following when conducting inspections of completed works in an existing Health facility:

- All building alterations are accurate and updated on CAD drawings, which comply with the standards as outlined in this document.
- Check Room/Space functional changes against NMHS master plans and update as necessary.
- Check existing room numbers against the room numbers on NMHS master drawings and update as necessary.

Services Drawings

Drawings provided by NMHS

Existing Site Plan and Floor Plan “As Constructed” services drawings will be supplied by the NMHS CAD Officer-Documents Controller when requested. Drawings will be provided in AutoCAD .DWG format, and shall be used as the base for all services drawings unless otherwise specified.

Services Drawing Requirements

NMHS generally require plan drawings to include ‘Site Services’ and ‘Building Services’. Site Services shall be drawn in model space at 1:1 scale and for presentation purpose, layout space can be used with an appropriate Viewport scale of 1:200 or 1:500 for Site services and 1:100 scale for building services.

If drawings do not fit onto drawing sheets at the recommended scale, then consult with the NMHS Representative.

Services drawings shall be created as unique drawing files. Under no circumstances shall Services Information be added to original As-constructed Architectural base site plans and floor plans. Base Architectural drawings shall be duplicated by x-referencing (or inserting) them into the services drawing.

Separate Services drawings shall be created for each discipline. Generally, discipline-based drawings should be further broken down to unique services. Multiple services in the one Discipline can be combined on the one drawing only when all services documented can be clearly presented.

Services information to be drafted should be defined in explicit services briefs for each project.

Completed Drawings

Completed drawings require approval by NMHS (Principal’s Representative) prior to submission.

A check plot (pdf format) is to be provided to NMHS Drawing Office for checking prior to issue of final plots. Once checked and approved, a copy of the finished drawing shall be provided.

Where Master Services Plans have been provided to the Consultant and/or Contractor by NMHS it shall be the responsibility of Consultant and/or Contractor, to update those master service plans and return the plans with updates to NMHS.



All Intellectual property rights and ownership of all CAD drawings and Building Models resides with the Principal in accordance with the contract agreement and Copyright Act 1968.

For Further information please contact the NMHS Drawing Office, E: NMHS.Drawingoffice@health.wa.gov.au

New Facilities Drawings and Practical Completion

Note: *This section applies only to practical completion documentation for completely new facilities. It does not apply to additions or alterations to existing buildings.*

The NMHS have recognised the need for Asset Management Plans to be a requirement of new construction following the increasing trend in Government, toward Facilities Management applications. This section details what Consultants and/or Contractors must supply at Practical Completion of 'New Facilities'.

The Consultant and/or Contractor shall supply the following on Digital storage device upon practical completion:

- An electronic copy of the site and floor plan/s in AutoCAD DWG format.
- A 'black and white' copy of each site and floor plan in Adobe PDF format.

Layering, colours, naming conventions etc. are to comply with the NMHS CADD Documentation Guideline and Standards'.

NOTE:

All Floor plans and Site plan for facilities drawings are to be the same standards specified above for Architectural drawings. Refer: Architectural drawings – Floor Plans and Site Plans.

The NMHS has detailed requirements for the Asset Management System – and for Plant and Equipment for its facilities. Please contact the NMHS Work Controls on E: NMHS.workscontrol@health.wa.gov.au or via reception on 6457 2800.



APPENDIX F: Layer Standards

This section contains a partial list of AIA recommended layers to be used when producing Design documentation, Construction or Facilities Management drawings for NMHS.

Discipline Designators

Level 1		Level 2																																									
<p>The Discipline Designator denotes the category of subject matter contained on the specified layer. The Discipline Designator is a two-character field. The first character is the discipline character, and the second character is an optional modifier.</p>		<p>The optional second character is used to further define the discipline character. Examples of the Level 2 Discipline Designators are shown below.</p>																																									
<table border="1"> <thead> <tr> <th>Designator</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>A</td><td>Architectural</td></tr> <tr><td>E</td><td>Electrical</td></tr> <tr><td>F</td><td>Fire Protection</td></tr> <tr><td>L</td><td>Landscape</td></tr> <tr><td>M</td><td>Mechanical</td></tr> <tr><td>P</td><td>Plumbing</td></tr> <tr><td>Q</td><td>Equipment</td></tr> <tr><td>S</td><td>Structural</td></tr> </tbody> </table>	Designator	Description	A	Architectural	E	Electrical	F	Fire Protection	L	Landscape	M	Mechanical	P	Plumbing	Q	Equipment	S	Structural	<table border="1"> <thead> <tr> <th>Designator</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>A</td><td>Architectural</td></tr> <tr><td>AD</td><td>Architectural Demolition</td></tr> <tr><td>AE</td><td>Architectural Elements</td></tr> <tr><td>AF</td><td>Architectural Finishes</td></tr> <tr><td>AG</td><td>Architectural Graphics</td></tr> <tr><td>AI</td><td>Architectural Interiors</td></tr> <tr><td>AS</td><td>Architectural Site</td></tr> <tr><td>ME</td><td>Mechanical-Electrical</td></tr> <tr><td>IR</td><td>Irrigation Services</td></tr> <tr><td>EC</td><td>Elect Comms</td></tr> <tr><td>MG</td><td>Medical Gases</td></tr> </tbody> </table>	Designator	Description	A	Architectural	AD	Architectural Demolition	AE	Architectural Elements	AF	Architectural Finishes	AG	Architectural Graphics	AI	Architectural Interiors	AS	Architectural Site	ME	Mechanical-Electrical	IR	Irrigation Services	EC	Elect Comms	MG	Medical Gases
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Standards Layer Listing

Major groups are highlighted in the following tables.

Architectural

CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	A-ANNO-TEXT	General Text			continuous
	A-ANNO-REDL	Redlines			continuous
	A-ANNO-SYMB	Symbols			continuous
	A-ANNO-LEGN	Legends and schedules			continuous
	A-ANNO-DIMS	Dimensions			continuous
	A-ANNO-TTLB	Border and Title Block			continuous
	A-ANNO-NOTE	Job Notes			continuous



CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	A-ANNO-NPLT	Construction lines, non-plotting information, viewports			continuous
	A-ANNO-KEYN	Key notes			continuous
	A-AREA	Area Space boundary lines			Continuous
	A-AREA-INT	Area boundary line Internal Gross			continuous
	A-AREA-EXT	Area boundary line External Gross			continuous
	A-AREA-IDEN	Room numbers, tenant identifications, area calcs			continuous
	A-AREA-OCCP	Occupant or employee names			continuous
	A-AREA-PATT	Area cross hatching			continuous
	A-CLNG	Ceiling information			continuous
	A-CLNG-GRID	Ceiling grid			continuous
	A-CLNG-PATT	Ceiling patterns			continuous
	A-CLNG-SUSP	Suspended elements			continuous
◆	A-DOOR	Doors			continuous
	A-DOOR-IDEN	Door number, hardware group, etc.			continuous
	A-EQPM	Equipment - built in			continuous
	A-EQPM-CLNG	Ceiling-mounted or suspended equipment			continuous
	A-EQPM-FIXD	Fixed equipment			continuous
	A-EQPM-IDEN	Equipment identification numbers			continuous
	A-EQPM-MOVE	Moveable equipment			continuous
◆	A-FLOR	Floor information			continuous
	A-FLOR-CASE	Casework (manufactured cabinets)			continuous
	A-FLOR-EVTR	Elevator cars and equipment			continuous
	A-FLOR-HRAL	Stair and balcony handrails, guard rails			continuous
	A-FLOR-IDEN	Room numbers, names, targets, etc.			continuous
	A-FLOR-LEVL	Level changes, ramps, pits, depressions			continuous
	A-FLOR-PATT	Paving, tile, carpet patterns			continuous
	A-FLOR-SIGN	Signage			continuous
	A-FLOR-SPCL	Architectural specialties (accessories, etc.)			continuous
	A-FLOR-STRS	Stair treads, escalators, ladders			continuous
	A-FLOR-TPTN	Toilet partitions			continuous
	A-FLOR-WDWK	Architectural woodwork (field-built cabs/counters)			continuous
◆	A-GLAZ	Windows, curtain walls, glazed partitions			continuous
	A-GLAZ-FULL	Full-height glazed walls and partitions			continuous
	A-GLAZ-IDEN	Window number			continuous
	A-GLAZ-PHRT	Windows and partial-height glazed partitions			continuous
	A-GLAZ-SILL	Window sills			continuous



CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
◆	A-ROOF	Roof			continuous
	A-ROOF-LEVEL	Level changes			continuous
	A-ROOF-OTLN	Roof outline			continuous
	A-ROOF-PATT	Roof surface patterns, hatching			continuous
◆	A-WALL	Walls – general			continuous
◆	A-WALL-INTR	Interior Building Wall			continuous
	A-WALL-FIRE	Fire wall patterning			continuous
	A-WALL-FULL	Full-height walls, stairs and shaft walls			continuous
◆	A-WALL-EXTR	Exterior Building Wall			continuous
	A-WALL-HEAD	Door / window headers (on reflected ceiling plans)			continuous
	A-WALL-JAMB	Door / window jambs (on floor plans only)			continuous
	A-WALL-MOVE	Moveable partitions			continuous
	A-WALL-PATT	Wall insulation, hatching and fill			continuous
◆	A-WALL-PART	Partial-height walls (on floor plans only)			continuous
◆	A-WIND	Windows			continuous

Structural

CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	S-ANNO-TEXT	General Text			continuous
	S-ANNO-SYMB	Symbols			Continuous
	S-ANNO-LEGN	Legends and schedules			Continuous
	S-ANNO-DIMS	Dimensions			continuous
	S-ANNO-TTLB	Border and Title Block			Continuous
	S-ANNO-NOTE	Job Notes			Continuous
	S-BEAM	Beams			Continuous
◆	S-COLS	Columns			Continuous
	S-FNDN	Foundation			Continuous
	S-FNDN-PILE	Piles, drilled piers			Continuous
	S-FNDN-RBAR	Foundation reinforcing			Continuous
◆	S-GRID	Column grid			Continuous
	S-GRID-DIMS	Column grid dimensions			Continuous
	S-GRID-EXTR	Column grid outside building			Continuous
	S-GRID-IDEN	Column grid tags			Continuous
	S-GRID-INTR	Column grid inside building			Continuous



CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	S-WALL	Structural bearing or shear walls			continuous

Hydraulics

CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	P-ANNO-TEXT	General Text			continuous
	P-ANNO-SYMB	Symbols			continuous
	P-ANNO-LEGN	Legends and schedules			continuous
	P-ANNO-TTLB	Border and Title Block			continuous
	P-ANNO-NOTE	Job Notes			continuous
	P-ACID	Acid, alkaline, oil waste systems			continuous
	P-ACID-PIPE	Acid, alkaline, oil waste piping			continuous
	P-DOMW	Domestic hot and cold-water systems			continuous
	P-DOMW-CPIP	Domestic cold-water piping			continuous
	P-DOMW-EQPM	Domestic hot and cold-water equipment			continuous
	P-DOMW-HPIP	Domestic hot water piping			continuous
	P-DOMW-RISR	Domestic hot and cold-water risers			continuous
	P-EQPM	Plumbing - miscellaneous equipment			continuous
	◆ P-FIXT	Plumbing fixtures, toilets, sinks			continuous
	◆ P-PLUM	Plumbing General			continuous
	P-SANR	Sanitary drainage			continuous
	P-SANR-EQPM	Sanitary equipment			continuous
	P-SANR-FIXT	Plumbing fixtures			continuous
	P-SANR-FLDR	Floor drains			continuous
	P-SANR-PIPE	Sanitary piping			continuous
	P-SANR-RISR	Sanitary risers			continuous
	P-STRM	Storm drainage system			continuous
	P-STRM-PIPE	Storm drain piping			continuous
	P-STRM-RFDR	Roof drains			continuous

Mechanical

CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	M-ANNO-TEXT	General Text			continuous
	M-ANNO-SYMB	Symbols			continuous
	M-ANNO-LEGN	Legends and schedules			continuous



CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	M-ANNO-TTLB	Border and Title Block			continuous
	M-ANNO-NOTE	Job Notes			continuous
	M-CMPA	Compressed air systems			continuous
	M-CMPA-CEQP	Compressed air equipment			continuous
	M-CMPA-CPIP	Compressed air piping			continuous
	M-CMPA-PEQP	Process air equipment			continuous
	M-CMPA-PPIP	Process air piping			continuous
	M-CONT	Controls and instrumentation			continuous
	M-CONT-THER	Thermostats			continuous
	M-CONT-WIRE	Low voltage wiring			continuous
	M-CWTR	Chilled water systems			continuous
	M-CWTR-EQPM	Chilled water equipment			continuous
	M-CWTR-PIPE	Chilled water piping			continuous
	M-EXHS	Exhaust system			continuous
	M-EXHS-DUCT	Exhaust system ductwork			continuous
	M-EXHS-EQPM	Exhaust system equipment			continuous
	M-EXHS-RFEQ	Rooftop exhaust equipment			continuous
	M-FUME-EQPM	Fume hoods			continuous
	M-FUME-EXHS	Fume hood exhaust system			continuous
	M-HOTW	Hot water heating system			continuous
	M-HOTW-EQPM	Hot water equipment			continuous
	M-HOTW-PIPE	Hot water piping			continuous
	M-HVAC	HVAC system			continuous
	M-HVAC-CDFF	HVAC ceiling diffusers			continuous
	M-HVAC-DUCT	HVAC ductwork			continuous
	M-HVAC-EQPM	HVAC equipment			continuous
	M-HVAC-ODFF	HVAC other diffusers			continuous
	M-HVAC-RDFF	Return air diffusers			continuous
	M-HVAC-SDFF	Supply diffusers			continuous
	M-MDGS	Medical gas systems			continuous
	M-MDGS-EQPM	Medical gas equipment			continuous
	M-MDGS-PIPE	Medical gas piping			continuous
	M-SPCL	Special systems			continuous
◆	M-SPCL-EQPM	Special equipment			continuous
	M-SPCL-PIPE	Special piping			continuous
	M-STEM	Steam systems			continuous



CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	M-STEM-CONP	Steam systems condensate piping			continuous
	M-STEM-EQPM	Steam systems equipment			continuous
	M-STEM-HPIP	High pressure steam piping			continuous
	M-STEM-LPIP	Low pressure steam piping			continuous
	M-STEM-MPIP	Medium pressure steam piping			continuous

Electrical

CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	E-ANNO-TEXT	General Text			
	E-ANNO-SYMB	Symbols			
	E-ANNO-LEGN	Legends and schedules			
	E-ANNO-DIMS	Dimensions			
	E-ANNO-TTLB	Border and Title Block			
	E-ANNO-NOTE	Job Notes			continuous
	E-1LIN	One-line diagrams			continuous
	E-ALRM	Miscellaneous alarm system			continuous
	E-AUXL	Auxiliary systems			continuous
	E-CCTV	Closed-circuit TV			continuous
	E-COMM	Telephone, communications outlets			continuous
	E-CTRL	Electric control system			continuous
	E-CTRL-DEVC	Control system devices			continuous
	E-CTRL-WIRE	Control system wiring			continuous
◆	E-ELEC	Electrical General			
	E-INTC	Intercom system			continuous
	E-LITE	Lighting			continuous
	E-LITE-CIRC	Lighting circuits			continuous
	E-LITE-CLNG	Ceiling-mounted lighting			continuous
	E-LITE-EMER	Emergency lighting			continuous
	E-LITE-EXIT	Exit lighting			continuous
	E-LITE-FLOR	Floor-mounted lighting			continuous
	E-LITE-IDEN	Luminaire identification and text			continuous
	E-LITE-JBOX	Junction box			continuous
	E-LITE-NUMB	Lighting circuit numbers			continuous
	E-LITE-ROOF	Roof lighting			continuous
	E-LITE-SPCL	Special lighting			continuous



CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	E-LITE-SWCH	Lighting-switches			continuous
	E-LITE-WALL	Wall-mounted lighting			continuous
	E-SERT	Security			continuous
	E-NURS	Nurse call devices			continuous
◆	E-MECH	Mech/Elect			
	E-POWR	Power			continuous
	E-POWR-BUSW	Busways			continuous
	E-POWR-CABL	Cable trays			continuous
	E-POWR-CIRC	Power circuits			continuous
	E-POWR-CLNG	Power-ceiling receptacles and devices			continuous
	E-POWR-EQPM	Power equipment			continuous
	E-POWR-FEED	Feeders			continuous
	E-POWR-IDEN	Power identification, text			continuous
	E-POWR-JBOX	Junction box			continuous
	E-POWR-NUMB	Power circuit numbers			continuous
	E-POWR-OTLN	Power outline for backgrounds			continuous
	E-POWR-PANL	Power panels			continuous
	E-POWR-SWBD	Power switchboards			continuous
	E-POWR-URAC	Underfloor raceways			continuous
	E-POWR-WALL	Power wall outlets and receptacles			continuous
	E-RISR	Riser diagram			continuous
	E-SOUN	Sound/PA system			continuous

Interior Fit-out

CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	I-ANNO-TEXT	General Text			continuous
	I-ANNO-SYMB	Symbols			continuous
	I-ANNO-LEGN	Legends and schedules			continuous
	I-ANNO-DIMS	Dimensions			continuous
	I-ANNO-TTLB	Border and Title Block			continuous
	I-ANNO-NOTE	Job Notes			continuous
	I-EQPM	Equipment			continuous
	I-EQPM-MOVE	Moveable equipment			continuous
◆	I-FURN	Furniture			continuous
	I-FURN-CASE	Cabinetry / casement			continuous



CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	I-FURN-CHAR	Chairs and other seating			continuous
	I-FURN-FILE	File cabinets			continuous
	I-FURN-FREE	Furniture - freestanding (desks, credenzas, etc.)			continuous
◆	I-FURN-IDEN	Furniture numbers			continuous
	I-FURN-PLNT	Plants			continuous
	I-FURN-PNLS	Furniture system panels			continuous
	I-FURN-POWR	Furniture system-power designation			continuous
	I-FURN-WKSF	Furniture system work surface components			continuous

Fire Protection

CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	F-ANNO-TEXT	General Text			continuous
	F-ANNO-SYMB	Symbols			continuous
	F-ANNO-LEGN	Legends and schedules			continuous
	F-ANNO-DIMS	Dimensions			continuous
	F-ANNO-TTLB	Border and Title Block			continuous
	F-ANNO-NOTE	Job Notes			continuous
	F-CO2S	CO2 system			continuous
	F-CO2S-EQPM	CO2 equipment			continuous
	F-CO2S-PIPE	CO2 sprinkler piping			continuous
	F-HALN	Halon			continuous
	F-HALN-EQPM	Halon equipment			continuous
	F-HALN-PIPE	Halon Piping			continuous
	F-IGAS	Inert gas			continuous
	F-IGAS-EQPM	Inert gas equipment			continuous
	F-IGAS-PIPE	Inert gas piping			continuous
	F-PROT	Fire protection systems			continuous
	F-PROT-ALRM	Fire alarm			continuous
	F-PROT-EQPM	Fire system equipment (hose cabinet/extinguishers)			continuous
	F-PROT-SMOK	Smoke detectors/heat sensors			continuous
	F-SPRN	Fire protection sprinkler system			continuous
	F-SPRN-CLHD	Sprinkler head-ceiling			continuous
	F-SPRN-OTHD	Sprinkler head-other			continuous
	F-SPRN-PIPE	Sprinkler piping			continuous
	F-SPRN-STAN	Sprinkler system standpipe			continuous



CORE	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	F-STAN	Fire protection standpipe system			continuous

Facilities Management (FM)

	LAYER		ATTRIBUTE		
	Name	Description	Colour	Lineweight	Linetype
	AREA	Area Space boundary lines			Continuous
	AREA-IG	Area boundary line Internal Gross			Continuous
	AREA-EG	Area boundary line External Gross			Continuous
	A-AREA-IDEN	Space ID's, (Room Identification)			Continuous
	A-AREA-OCCP	Occupant or employee names			Continuous
	A-AREA-PATT	Area cross hatching			Continuous
	S-COLS	Columns			Continuous
	A-DOOR	Doors			Continuous
	A-EQPM	Equipment			Continuous
	A-FIRE	Fire Walls, Equipment etc			Continuous
	A-FIRE-RATE	Fire Rating			Continuous
	P-FIXT	Plumbing fixtures, toilets, sinks			Continuous
	A-FLOR	Floor information			Continuous
	I-FURN	Furniture			Continuous
	A-GLAZ	Windows, curtain walls, glazed partitions			Continuous
	A-GRID	Grid from architectural			Continuous
	A-GRIDTEXT				Continuous
	S-GRID	Column grid			Continuous
	A-LIFT	LIFTS			Continuous
	A-STAIR	Stair Case			Continuous
	A-TEXT	Text			Continuous
	A-WALL	Walls – general			Continuous
	A-WALL-INTR	Walls – Internal			Continuous
	A-WALL-EXTR	Walls – general			Continuous
	A-WALL-PART	Walls – Partitions			Continuous
	A-WIND	Windows			Continuous
	E-ELEC	Electrical General			Continuous
	A-ROOF	Roof details			Continuous
	A-RNAM	Temp Room Name layer used as a means for importing room names txt into the FM system DB			Continuous



LAYER		ATTRIBUTE		
Name	Description	Colour	Lineweight	Linetype
A-RNUM	Temp Room Number layer used as a means for numbering spaces in txt and importing room tags into the FM System			Continuous
Q-EQUIP	General Equipment			Continuous
M-PLANT	Mechanical Equipment			Continuous
XREF	External Reference drawing Layer			Continuous



APPENDIX G: CADD Drawing Checklist

CADD DRAWING CHECKLIST

PROJECT NAME: _____

NMHS Project Ref. No.: _____ DISCIPLINE: _____

Tick the box to indicate compliance with NMHS requirements.

- All disks have been scanned for virus infections.
- All file names comply with NMHS drawing file naming convention
- Drawings produced on NMHS standard drawing sheets.
- The current layer to all drawings is set to 0.
- The drawing units are full size and the drawing measurement is set to millimetres for building works or metres for geographical drawings (survey drawings)
- The limits are set to the CORRECT SHEET SIZE with the bottom left hand corner set to 0,0. (Model space limits equals what model space uses)
- The drawing is in model space i.e. Tile mode set to 1.
- All layers are turned on.
- All entities not required have been deleted.
- The Entity colours conform to the NMHS CADD Documentation Guideline and Standards' Manual.
- Text styles, line types & hatching conform to the NMHS CADD Documentation Guideline and Standards' Manual.
- All entities are placed on their correct layer, using the NMHS layering protocol.
- All drawings have all unused layers, line types, blocks, text styles etc. purged from the drawing(s) and all extraneous information erased.
- All Existing Services Base Plans have been updated & provided as detailed in the Manual.
- Asset Management Plans have been provided as detailed in the Manual.
- All Xref drawing(s) files used in the production of the drawings are provided
- The CADD drawing information sheet has been completed including indication of Xref's.
- Each "As Constructed" drawing is clearly labelled and marked as such.

CONSULTANT/CONTRACTOR NAME: _____

SIGNATURE _____

(Authorised Person)

DATE: _____

COMMENTS.....
.....

ACCEPTED RETURNED



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