



Lower Mainland Facilities Management – Systems & Support – Drawing Services

# LMFM Drawing Standards For Consultants

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***Please direct any questions or comments about this document to the address below.***

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## General Information

### Definition of Project Record Drawings

A final, complete set of drawings at the completion of a project that have been field verified after completion of the construction of the project and then revised as required to accurately incorporate any changes that were made to the original design during the construction period. These drawings are considered the archived record of the actual design and construction of the project and are saved in their original format as a historical record of the project.

### Purpose

The Lower Mainland Facilities Management Systems and Support (LMFM) Drawing Services facilitates the continuity, quality control, and communication of Computer Aided Drafting (CAD), Computer Aided Facility Management (CAFM) for over 2.4 million square metres (26 million square feet) of space across the Lower Mainland, which is critical to manage the LMFM property and capital assets.

By the standardized collection of information for all owned and leased property through close contact with Consultants and LMFM Facilities Services, LMFM Drawing Services will:

- Consult on and monitor the compliance with the LMFM Drawing Services Standards and Procedures.
- Integrate Project Record Drawings into the LMFM existing condition drawings and update department changes to LMFM's centralized CAFM system.
- Provide consultants with access to the current LMFM Record drawings for use as a base for future facility projects.
- Provide customers with updated information on LMFM's facilities as requested.

### Use

This document has been written with specific instructions to consultants for producing and delivering Record Drawings, and establishes the standards and guidelines to organize the data captured in the LMFM drawings.

LMFM CAD Floor Plan Drawings are a “stripped down” version of the Project Record drawings and typically contain only 20% to 30% of the information on the project drawings (showing the basic architectural layout – walls, doors, windows, and room numbers). They are maintained as the current status of a building, and used as a reference (XREF) file for the CAFM drawings. They are updated by using information from consultant's project Record Drawings as construction projects are completed and can then be provided back to the consultants for use as background information for future construction projects. CAFM Floor Plans are further simplified drawings that contain only ARCHIBUS facility asset information.

It is necessary to establish these standards to promote the sharing of information and to maintain the integrity of the CAFM system. CAD drawings are required for all CAD based projects, regardless of the size, or complexity of the project.

### Disclaimer on Record Drawing Use by LMFM

LMFM requires that all consultants provide Record Drawings at the completion of each project. LMFM recognizes that these files should not be used in whole or in part for the design and construction of other projects. The consultants are not responsible for any subsequent changes made to the files by LMFM. However, LMFM does reserve the right to use these files as a source to generate floor plans for LMFM purposes.

## Deliverables Required for Project Record Drawings

### Summary

The following deliverables are to be provided by design consultants for Project Record drawings. A full set of field verified Project Record drawings for all disciplines must be submitted to the LMFM project manager upon project completion and are required for all projects, regardless of the size, or complexity of the project. An As-Built or Record date stamp on all drawings is MANDATORY.

**Any other version or issuance of drawings other than RECORD (eg: Issued for Construction, Issue for Tender, etc.) will NOT BE ACCEPTED and will be returned to the consultant to resolve and to re-submit the RECORD drawing.**

Summary of Deliverables (based on project type) shown in the table below:

<u>DELIVERABLE</u>	<u>CAD based project</u>
Record CAD Drawing Files	All drawings*
Record PDF Files	All drawings**
Drawing Catalog Info	Excel worksheet
Prints (Hardcopy)	All drawings <ul style="list-style-type: none"> <li>• 1 set of full size</li> <li>• 1 set of half size</li> </ul> (confirm with LMFM PM if required) Documents (if required) <ul style="list-style-type: none"> <li>• O&amp;M manuals</li> <li>• Specifications</li> </ul>
Closeout Checklist	Completed Appendix A Project Closeout Checklist

Notes:

- \* If some CAD drawings cannot be submitted due to Intellectual Property rights, they must be submitted in PDF. However, all floor plans MUST be submitted in CAD (DWG) format. NO EXCEPTIONS!
- \*\* The PDF files MUST match and display the same information as the CAD file.

## Drawing File Format

CAD drawings must be submitted to LMFM Drawing Services in AutoCAD 2014 format and in full compliance with Autodesk AutoCAD software (file extension = .DWG). Throughout this document, the use of the name AutoCAD always implies “Genuine Autodesk Software” unless otherwise noted.

***DXF files submitted in place of DWG files will NOT BE ACCEPTED at project closeout as a substitution for DWG CAD file deliverables.***

### CAD File Translation for Error-free AutoCAD Drawing Deliverables

LMFM recognizes that many of its construction service providers do not use the same CAD systems as LMFM Drawing Services. However, LMFM expects that service providers who work with non-AutoCAD file formats will submit DWG formatted CAD files upon project closeout that are fully compliant with all of the standards outlined herein, and which have no significant loss of drawing entities or project data that can result from standard CAD file translation procedures.

All DWG files and CAD drawing entities submitted at the end of a project must be able to be manipulated using standard AutoCAD drafting procedures.

***Non-compliance with this policy may result in the rejection of CAD files submitted at project closeout in addition to delayed rendering of final project payment.***

For firms translating their native CAD file format into AutoCAD format also concerned about delivering error-free CAD files to LMFM upon project closeout, it is strongly recommended that thorough file translation testing be conducted before the drawing development phase of the project. This will assure early detection of file conversion issues, if any, and allow for corrective measures to be taken before the project closeout period.

## File Sharing

The practice of sharing or offering access to digital information or resources will be known in this document as File Sharing.

Acceptable formats include (but are not limited to):

- USB Flash Drives
- Email Attachments
- File Transfer Protocol (FTP) Sites
- Cloud Storage Services (eg. Dropbox)

Include a transmittal with the following information when sharing the files:

- LMFM Project Number
- LMFM Project Name
- LMFM Project Manager
- Building Name
- Floor Level
- Consultant Name
- Date Submitted
- Content: Record Dwgs; CAD; PDF; Excel

## Drawing Catalog Format

The Consultant is required to provide the drawing catalog information for the project.

### Template for Excel spreadsheet format

The Consultant is required to provide drawing catalog information (Drawing List) in a Microsoft Excel spreadsheet file. A separate record or line must be created for each drawing sheet submitted. If a sheet has information for more than one floor or building, create another record. The Excel version used should be compatible with to be compatible with Microsoft Excel 2010 or earlier.

- Text must be all CAPITALS.
- The HSDA Code, Site Code, Bldg Code - as specified by LMFM.
- Project Name - as specified by LMFM.
- Drawing Description.
- Discipline Type must follow the list provided in the LMFM Drawing Services Naming Conventions section of this document.
- The File Name should have the sheet (Dwg) number.
- Health Area Project # - as provide by LMFM.
- The consultant name.
- The drawing date is the Record drawing date and not the date drawn. Format is YYYY-MM-DD.

An example Microsoft Excel spreadsheet follows:

HSDA Code	Site Code	Bldg Code	Project Name	Dwg Description	Discipline	Dwg #	File Name	Heath Area Project #	Consultant	Dwg Date

An example with Project information entered:

HSDA Code	Site Code	Bldg Code	Project Name	Dwg Description	Discipline	Dwg #	File Name	Heath Area Project #	Consultant	Dwg Date
FHA	303	0796	EAGLE RIDGE HOSPITAL EXTENDED CARE	DRAWING LIST, LEGEND, INSTALLATION HEIGHTS	ARCH	A-0	A-0	1994-1050	STANTEC	1994-05-30
RHS	650	0050	RICHMOND HOSPITAL PHASE 2 PROJECT	GROUND LEVEL DETAILS	STRUCT	S100	S100	1997-6010	BUSH BOHLMAN	1997-11-12
VA	303	0796	MEDICAL STUDENT & ALUMNI CENTRE	SITE PLAN	MECH	M-1	M-1	1993-3221	KEEN ENGINEERING	1996-10-24

## LMFM Drawing Services Naming Conventions

### Project Information (LMFM Site, Building Codes and Project Numbers)

Contact FM Support ([FMSupport@fraserhealth.ca](mailto:FMSupport@fraserhealth.ca)) for:

- Site Code
- Building Code

Contact the LMFM Project Manager for the specific project information:

- project name
- project number

### Discipline List

<u>Discipline Code</u>	<u>Discipline Description</u>
ARCH	Architectural (including Shop Drawings)
CIVIL	Civil Services, Topography, Survey, Contour Lines
COMM	Low power communication and auxiliary
ELEC	Electrical power and lighting
EQUIP	Equipment (food services, elevators, and radiology equipment)
FIRE	Fire protection (low power sensors and sprinklers)
LAND	Landscaping
MECH	Mechanical (including HVAC and some plumbing)
PLUMB	Plumbing (including Medical Gases)
STRUCT	Structural and seismic

### Floor Naming

<u>Floor Number or Abbreviation</u>		And Optionally	<u>Floor Number or Abbreviation</u>	
	XX		XX	
Two-digit from 00to 99	00 ... 99		00 ... 99	Two-digit from 00to 99
Tunnel	TN		ML	Mechanical
Parking	PK		MZ	Mezzanine
Sub-Basement	SB		LW	Lower
Basement	BT		UP	Upper
Main	MN		AT	Attic
Lower Ground	LG		CS	Crawl Space
Ground	GR		RF	Roof
Penthouse	PH			
Roof	RF			

Examples:

03 = Third Floor  
 RF = Roof (of building)  
 MNMZ = Main Mezzanine  
 11RF= Eleventh Floor Roof

GRML= Ground Mechanical  
 PK01= Parking First Floor  
 PHRF= Penthouse Roof

Note: The Floor ID on its own does not uniquely identify a space and should always be shown with the associated Building ID.

**Room Naming**

Standard Abbreviations for selected Core Room Types

	Core Room Number Abbreviation	Room Type Description	Room Number Examples
CAD	CORR	Corridor	CORR-01
	ATR	Atrium	ATR-01
	STR	Stairwell	STR-01
	SFT	Shaft	SFT-01
	ELV	Elevator	ELV-01
	DMW	Dumbwaiter	DMW-01

**CAD based Project Drawing Submission Guidelines**

**External Reference Files (XREFs)**

LMFM will not accept the submission of any CAD drawing deliverable that contains references to external source drawing files. All externally referenced data sources that were used during the CAD drawing production phase should be purged, inserted, bound and retained as a block within a single drawing file, with no loss of layer naming, and include the title block, upon project completion and prior to drawing delivery to LMFM.

**Any XREF or externally referenced data sources that aren't bound and retained in the CAD file and are submitted separately will NOT BE ACCEPTED and will be returned to the consultant to resolve and re-submit.**

All file types used such as logos; images; excel spreadsheets; pdf underlays etc. should be embedded into the drawing. Use the Bind Insert command so that XREF layers keep their original name.

**Model Space and Paper Space**

Ensure that all items (title block, drawing, etc.) in the paper space tab are within the selected paper size.

Each CAD file shall only have one paper space tab (referencing one drawing sheet). Files with multiple paper space tabs (referencing multiple drawings) are NOT ACCEPTED.

All paper space viewports shall be locked to avoid mistakenly resizing any viewport.



## Title Blocks

Consultants may use their own title blocks. Ensure any consultant logos are embedded into the title block (or the file referencing the logo is submitted with the project deliverables). Each drawing shall have only one title block inserted in paper space, with its lower left hand corner point inserted at a coordinate location of (0, 0, 0).

The drawing's title block should contain the information listed below.

### Project Information:

- Name of Consulting Firm - representing the drawing author
- Project Name - as specified by LMFM
- Building Code - as specified by LMFM
- Building & Floor Name - *specify only if the project name does not include this information already, and the project is building specific*
- LMFM Project Number – as specified by LMFM
- Consultant Project Number - assigned by the consultant
- LMFM or Health Authority Logo

### Drawing Information:

- Drawing Title - indicate the drawing content, e.g. floor plan, section, detail, etc.
- Drawing Number – Use industry standard practice of including the discipline code as a prefix in the file name e.g. A-01, M-01 etc.
- Date of Drawing - original drawing date
- Revisions- information for any significant revision dates
- Record Drawing Stamp – dated and signed
- Drawing Scale - representing the intended plot scale of the drawing with the title block
- North Arrow

## Drawing Layer Standards

LMFM has adopted the guidelines for layer name and use rules recommended by the “AIA CAD Layer Guidelines” 2005. This manual is published by the AIA (American Institute of Architects) and was developed through a task force comprising of representatives from the AIA, IFMA (International Facility Management Association), the American Consulting Engineers Council, the American Society of Civil Engineers and three U.S. Government agencies. It is a guideline for CAD layer designations which can be used to create drawings suitable for architectural, engineering and facility management applications.

Where noted, LMFM Drawing Services has supplemented the AIA guidelines with its own rules and standards.

### Layer Names

Layers must be identified by name, but may have a numeric suffix. This standard is based on the premise that layer names provide more flexibility in data organization and allow optimum user recognition of the layer content.

Layer Formats

Two formats are commonly used to name layers. The long format uses 6 to 16 characters and provides better user recognition of the layer content. The short format uses an abbreviation of the long format within 3 to 8 characters, LMFM uses the abbreviated version.

Major Groups

Discipline Codes			
A-	Architectural	M-	Mechanical
C-	Civil	P-	Plumbing
E-	Electrical	Q-	Equipment
F-	Fire Protection	S-	Structural
G-	General	T-	Telecommunications
H-	Hazardous Materials	U-	(LMFM defined)
I-	Interiors	X-	Other disciplines
L-	Landscape	Z-	Contractor / shop drawings

Minor Groups

This group designation is a four-character designation used to subdivide the major groups based on construction components or building contents. e.g. walls, doors, ceilings, furniture, equipment, etc.

Modifiers

This is an optional, four-character field for further differentiation of major groups. For example, partial height walls (A-WALL-PART) might be differentiated from full height walls (A-WALL-FULL). The use of a modifier is optional and is not required if the major and minor group designations for a layer are sufficient.

Modifiers can also be used to differentiate phases of new construction from remodeling and existing to remain, and can be used in place of or in addition to a minor group designation, such as A-WALL-NEWW or A-WALL-FULL-NEWW. In either case, the modifier is always the last four-characters of the layer name.

Information Layers

The layer names for each major group are further divided into two categories for CAD layer management purposes.

*Building Information layers*

The layers generally represent physical aspects of the site and buildings such as walls, doors, site improvements, diffusers, etc. Identification labels such as room numbers are also included in this category. This type of information is often shared between drawings.

*Drawing Information layers*

The layers comprise notes, dimensions, and similar information. This type of information is usually associated with a specific drawing. Other specialty requirements such as riser diagrams and schematic diagrams are also included in this category.

### Special Groups

Special groups are not used in this layering standard as this information is not required for CAD and CAFM floor plans. However, these special groups may be used by consultants as required for design and construction drawings. The “Read-me” layer (x-RDME) may be used with all major groups to provide reference information on file organization. This layer is for user reference only and is not plotted.

### *Elevations, Sections, and Three-Dimensional Drawings*

Minor groups may be added to the major groups or used as modifiers of master layers: elevations, section, details, and three-dimensional views.

e.g. \*-DETL-PATT (detail textures & hatch patterns)

\*asterisk represents any major group (discipline code)

The minor group ELEV can also be added to any major group layer to identify information only seen in 3D views. This facilitates integrating three-dimensional CAD models with two-dimensional plans.

e.g. A-WALL (walls in plan view) or A-WALL-ELEV (wall surfaces in 3D view).

### *Annotation and Title Blocks*

The major group ANNO consisting of Annotation and other elements on CAD drawings that do not represent physical aspects of a building, can be combined with any discipline code.

e.g. \*-ANNO-DIMS (dimensions)

\*asterisk represents any major group (discipline code)

### Use

The layering standards have been designed to:

- Ensure that all future CAD based design drawings completed for all LMFM facilities are structured and formatted on a consistent basis for archival and retrieval purposes.
- Organize drawing information in layers which can be used for both initial project development and on-going facility management purposes.
- Organize graphical information so that it can be effectively grouped and manipulated for display, editing and plotting purposes.

### **Scale, Units and Tolerances**

All CAD drawings must be drafted at full scale in metric units, in that one drawing unit equals one millimeter. Tolerances for the drawings are implicit within professional service contracts. Drawings completed in Imperial units must be “hard converted” to Metric.  
e.g. 25.4mm = 1 inch.

### **Fonts, Text and Plot Styles**

Text styles and fonts may vary, but the use of font True Type fonts for most applications is preferable. Non Standard AutoCAD fonts, text styles, and shape files are NOT ACCEPTED. If non-standard fonts are unavoidable, then the font files appearing in the drawing must be included with the Project Deliverables submission.

Include all relevant CTB files and Plot style tables with the Project Deliverables.

## Blocks and Attributes

Consultants may use their own standards for blocks and symbols as long as they are created as follows:

- All entities within a block must be created on layer 0. Entities, which have been translated from non-AutoCAD based CAD systems, often fail to meet this requirement.
- Entities must be assigned colour- **By Layer**.
- Drawing entities translated into AutoCAD blocks from non-AutoCAD systems must revert to layer 0 when exploded within AutoCAD.
- Nested blocks are NOT ACCEPTED and should not be used.
- Blocks should be inserted onto their appropriate discipline layer.
- Blocks should be created with an insertion angle of 0 degrees and have an insertion point attached appropriately to the block.
- File translations from non-AutoCAD systems, which result in wall blocks within AutoCAD, are NOT ACCEPTED.

## Project Closeout Steps

Before a project can be closed out all specified materials must be submitted to the LMFM Project Manager or representative in accordance with production standards and specific instructions described in this document. A signed copy of the Project Closeout Checklist (Appendix A) must also be submitted with the Project Deliverables at the closeout phase of all projects. When a Closeout Checklist has been signed and submitted, the vendor (architect, engineer, contractor, etc.) is assuring that all materials adhere to the standards and guidelines set forth in this document.

1. Share the following Project Deliverables and send to the LMFM Project Manager a transmittal letter containing the specific project information:
  - a) All Record CAD Drawing files.
  - b) All Record Drawings in Raster format (PDF).  
**\*\*PDF files MUST match and display the same information as the CAD Record drawing file.**
  - c) Drawing Catalog Information file.
2. Send the hard copy drawings to the LMFM Project Manager with a transmittal letter containing the specific project information.
3. Send the Project Closeout Checklist (Appendix A), signed and dated with the above submittals.
4. The LMFM Project Manager will forward the Project Deliverables and Project Closeout Checklist to LMFM Drawing Services for compliance to the LMFM Standards and for inclusion into the existing condition drawings.

**Note: If there are issues with the Record Drawings or if there is missing information, the issues will be forwarded to the LMFM Project Manager and the Project Manager will contact the Prime Consultant to resolve.**

## APPENDIX A - Project Closeout Checklist

The consultant should use the following checklist to ensure that the submitted drawings conform to LMFM Standards.

### **CHECKLIST**

#### **Project Deliverables**

- All project Record CAD Drawings.
- All project Record Drawings in Raster Format (PDF format).
- Drawing Catalog file.
- 2 sets of Hard Copy Drawings (1 Full Size and 1 Half Size (confirm with LMFM PM)).
- If applicable, the Operation & Maintenance Manuals; Specifications in MS Word format or Raster format (PDF).
- Transmittal with the project information.

#### **File Format and Setup**

- Electronic File Format.
- Drawing Catalog File Format.

#### **LMFM Naming Conventions**

- Building and Floor Identification Codes.
- Discipline Identification Codes.
- Floor Naming.
- Room Naming.

#### **CAD Drawing Quality Assurance**

- Full AutoCAD Compliance.
- Translation Testing Procedures (if applicable).
- External Reference Files (XREFs) (Attached and Bound).
- Model Space and Paper Space (One Paper Space tab containing one drawing sheet for each CAD file).
- Title blocks.
- Drawing Layer Names.
- Scale, Units and Tolerances.
- Standard AutoCAD Fonts, Text & Plot Styles.
- Blocks and Attributes.

Name of Authorized Representative (please print): \_\_\_\_\_

Signature of Vendor Representative: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Date: \_\_\_\_\_

**ATTACH A SIGNED & DATED COPY WITH THE PROJECT DELIVERABLES**

## APPENDIX B - LMFM CAD Core Layers (Expanded List)

The LMFM CAD Core layers that are identified below by a diamond symbol (◆) should be used as the basis for construction drawings and supplemented as necessary by other layers in the expanded list.

CORE	LAYER	
◆	Name	Description
	Architectural	
◆	A-ANNO-TEXT	General Text
	A-ANNO-REDL	Redlines
	A-ANNO-SYMB	Symbols
	A-ANNO-LEGN	Legends and schedules
	A-ANNO-DIMS	Dimensions
	A-ANNO-TTLB	Border and Title Block
	A-ANNO-NOTE	Job Notes
	A-ANNO-NPLT	Construction lines, nonplotting information, viewports
	A-ANNO-KEYN	Key notes
	A-AREA	Area calculation boundary lines
	A-AREA-IDEN	Room numbers, tenant identifications, area calcs
	A-AREA-OCCP	Occupant or employee names
	A-AREA-PATT	Area cross hatching
	A-CLNG	Ceiling information
	A-CLNG-GRID	Ceiling grid
	A-CLNG-PATT	Ceiling patterns
	A-CLNG-SUSP	Suspended elements
◆	A-DOOR	Doors
	A-DOOR-IDEN	Door number, hardware group, etc.
◆	A-EQPM	Equipment - built in
	A-EQPM-CLNG	Ceiling-mounted or suspended equipment
	A-EQPM-FIXD	Fixed equipment
	A-EQPM-IDEN	Equipment identification numbers
	A-EQPM-MOVE	Moveable equipment
	A-FLOR	Floor information
	A-FLOR-CASE	Casework (manufactured cabinets)
◆	A-FLOR-EVTR	Elevator cars and equipment
◆	A-FLOR-HRAL	Stair and balcony handrails, guard rails
◆	A-FLOR-IDEN	Room numbers, names, targets, etc.
◆	A-FLOR-LEVL	Level changes, ramps, pits, depressions
	A-FLOR-PATT	Paving, tile, carpet patterns
	A-FLOR-SIGN	Signage
	A-FLOR-SPCL	Architectural specialties (accessories, etc.)
◆	A-FLOR-STRS	Stair treads, escalators, ladders
◆	A-FLOR-TPTN	Toilet partitions
	A-FLOR-WDWK	Architectural woodwork (field-built cabs/counters)
◆	A-GLAZ	Windows, curtain walls, glazed partitions
	A-GLAZ-FULL	Full-height glazed walls and partitions
	A-GLAZ-IDEN	Window number
	A-GLAZ-PHRT	Windows and partial-height glazed partitions
	A-GLAZ-SILL	Window sills
◆	A-ROOF	Roof
	A-ROOF-LEVL	Level changes
	A-ROOF-OTLN	Roof outline
	A-ROOF-PATT	Roof surface patterns, hatching
◆	A-WALL	Walls - general
	A-WALL-INTR	Interior Building Wall
	A-WALL-FIRE	Fire wall patterning

## LMFM Drawing Standards for Consultants

	A-WALL-FULL	Full-height walls, stairs and shaft walls
	A-WALL-EXTR	Exterior Building Wall
	A-WALL-HEAD	Door / window headers (on reflected ceiling plans)
	A-WALL-JAMB	Door / window jambs (on floor plans only)
◆	A-WALL-MOVE	Moveable partitions
	A-WALL-PATT	Wall insulation, hatching and fill
	A-WALL-PRHT	Partial-height walls (on floor plans only)

CORE	NAME	DESCRIPTION
◆	Civil	
	C-ANNO-DIMS	Dimensions
	C-ANNO-LEGN	Legends and schedules
	C-ANNO-NOTE	Notes
	C-ANNO-SYMB	Symbols
◆	C-ANNO-TEXT	General Text
	C-ANNO-TTLB	Border and Title Block
◆	C-BLDG	Proposed building footprints
	C-COMM	Site communication/telephone poles, boxes, towers
	C-FIRE	Fire protection-hydrants, connections
	C-NGAS	Natural gas-manholes, meters, storage tanks
	C-NGAS-UNDR	Natural gas-underground lines
◆	C-PKNG	Parking lots
	C-PKNG-ISLD	Parking islands
◆	C-PKNG-STRP	Parking lot striping, handicapped symbol
◆	C-PROP	Property lines, survey benchmarks
	C-PROP-BRNG	Bearings and distance labels
	C-PROP-CONS	Construction controls
	C-PROP-ESMT	Easements, rights-of-way, setback lines
◆	C-ROAD	Roadways
	C-ROAD-CNTR	Center lines
◆	C-ROAD-CURB	Curbs
	C-SSWR	Sanitary sewer-manholes, pumping stations
	C-SSWR-UNDR	Sanitary sewer-underground lines
	C-STRM	Storm drainage catch basins, manholes
	C-STRM-UNDR	Storm drainage pipe-underground
	C-TOPO	Proposed contour lines and elevations
	C-TOPO-RTWL	Retaining wall
	C-TOPO-SPOT	Spot elevations
	C-WATR	Domestic water- manholes, pumping, storage
	C-WATR-UNDR	Domestic water-underground lines

CORE	NAME	DESCRIPTION
◆	Electrical	
	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
	E-1LIN	One-line diagrams
	E-ALRM	Miscellaneous alarm system
	E-AUXL	Auxiliary systems
	E-CCTV	Closed-circuit TV
	E-COMM	Telephone, communications outlets
	E-CTRL	Electric control system



## LMFM Drawing Standards for Consultants

E-CTRL-DEVC	Control system devices
E-CTRL-WIRE	Control system wiring
E-INTC	Intercom system
E-LITE	Lighting
E-LITE-CIRC	Lighting circuits
E-LITE-CLNG	Ceiling-mounted lighting
E-LITE-EMER	Emergency lighting
E-LITE-EXIT	Exit lighting
E-LITE-FLOR	Floor-mounted lighting
E-LITE-IDEN	Luminaire identification and text
E-LITE-JBOX	Junction box
E-LITE-NUMB	Lighting circuit numbers
E-LITE-ROOF	Roof lighting
E-LITE-SPCL	Special lighting
E-LITE-SWCH	Lighting-switches
E-LITE-WALL	Wall-mounted lighting
E-POWR	Power
E-POWR-BUSW	Busways
E-POWR-CABL	Cable trays
E-POWR-CIRC	Power circuits
E-POWR-CLNG	Power-ceiling receptacles and devices
E-POWR-EQPM	Power equipment
E-POWR-FEED	Feeders
E-POWR-IDEN	Power identification, text
E-POWR-JBOX	Junction box
E-POWR-NUMB	Power circuit numbers
E-POWR-OTLN	Power outline for backgrounds
E-POWR-PANL	Power panels
E-POWR-SWBD	Power switchboards
E-POWR-URAC	Underfloor raceways
E-POWR-WALL	Power wall outlets and receptacles
E-RISR	Riser diagram
E-SOUN	Sound/PA system

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



## LMFM Drawing Standards for Consultants

F-SPRN-OTHD	Sprinkler head-other
F-SPRN-PIPE	Sprinkler piping
F-SPRN-STAN	Sprinkler system standpipe
F-STAN	Fire protection standpipe system

### Interior

I-ANNO-TEXT	General Text
I-ANNO-SYMB	Symbols
I-ANNO-LEGN	Legends and schedules
I-ANNO-DIMS	Dimensions
I-ANNO-TTLB	Border and Title Block
I-ANNO-NOTE	Job Notes
I-EQPM	Equipment
I-EQPM-MOVE	Moveable equipment
◆ I-FURN	Furniture
I-FURN-CASE	Cabinetry / casement
I-FURN-CHAR	Chairs and other seating
I-FURN-FILE	File cabinets
I-FURN-FREE	Furniture - freestanding (desks, credenzas, etc.)
I-FURN-IDEN	Furniture numbers
I-FURN-PLNT	Plants
I-FURN-PNLS	Furniture system panels
I-FURN-POWR	Furniture system-power designation
I-FURN-WKSF	Furniture system work surface components

### CORE

### LAYER

◆ Name	Description
<b>Landscaping</b>	
L-ANNO-TEXT	General Text
L-ANNO-SYMB	Symbols
L-ANNO-LEGN	Legends and schedules
L-ANNO-TTLB	Border and Title Block
L-ANNO-NOTE	Job Notes
L-PLNT	Plant and landscape materials
L-PLNT-BEDS	Rock, bark, and other landscaping beds
L-PLNT-GRND	Ground cover and vines
L-PLNT-PLAN	Planting plants
L-PLNT-TREE	Trees
L-PLNT-TURF	Lawn areas
L-SITE	Site improvements
L-SITE-BRDG	Bridges
◆ L-SITE-DECK	Decks
L-SITE-FENC	Fencing
L-SITE-FURN	Site furnishings
L-SITE-PLAY	Play structures
L-SITE-POOL	Pools and spas
L-SITE-SPRT	Sports fields
L-SITE-STEP	Steps
L-SITE-WALL	Walls
L-WALK	Walks and steps
L-WALK-PATT	Walks and steps-cross-hatch patterns

### Mechanical

M-ANNO-TEXT	General Text
M-ANNO-SYMB	Symbols
M-ANNO-LEGN	Legends and schedules
M-ANNO-TTLB	Border and Title Block

## LMFM Drawing Standards for Consultants

M-ANNO-NOTE	Job Notes
M-CMPA	Compressed air systems
M-CMPA-CEQP	Compressed air equipment
M-CMPA-CPIP	Compressed air piping
M-CMPA-PEQP	Process air equipment
M-CMPA-PIIP	Process air piping
M-CONT	Controls and instrumentation
M-CONT-THER	Thermostats
M-CONT-WIRE	Low voltage wiring
M-CWTR	Chilled water systems
M-CWTR-EQPM	Chilled water equipment
M-CWTR-PIPE	Chilled water piping
M-EXHS	Exhaust system
M-EXHS-DUCT	Exhaust system ductwork
M-EXHS-EQPM	Exhaust system equipment
M-EXHS-RFEQ	Rooftop exhaust equipment
M-FUME-EQPM	Fume hoods
M-FUME-EXHS	Fume hood exhaust system
M-HOTW	Hot water heating system
M-HOTW-EQPM	Hot water equipment
M-HOTW-PIPE	Hot water piping
M-HVAC	HVAC system
M-HVAC-CDFF	HVAC ceiling diffusers
M-HVAC-DUCT	HVAC ductwork
M-HVAC-EQPM	HVAC equipment
M-HVAC-ODFF	HVAC other diffusers
M-HVAC-RDFF	Return air diffusers
M-HVAC-SDFF	Supply diffusers
M-MDGS	Medical gas systems
M-MDGS-EQPM	Medical gas equipment
M-MDGS-PIPE	Medical gas piping
M-SPCL	Special systems
M-SPCL-EQPM	Special equipment
M-SPCL-PIPE	Special piping
M-STEM	Steam systems
M-STEM-CONP	Steam systems condensate piping
M-STEM-EQPM	Steam systems equipment
M-STEM-HPIP	High pressure steam piping
M-STEM-LPIP	Low pressure steam piping
M-STEM-MPIP	Medium pressure steam piping

CORE		LAYER
◆	Name	Description
	Plumbing	
	P-ANNO-TEXT	General Text
	P-ANNO-SYMB	Symbols
	P-ANNO-LEGN	Legends and schedules
	P-ANNO-TTLB	Border and Title Block
	P-ANNO-NOTE	Job Notes
	P-ACID	Acid, alkaline, oil waste systems
	P-ACID-PIPE	Acid, alkaline, oil waste piping
	P-DOMW	Domestic hot and cold water systems
	P-DOMW-CPIP	Domestic cold water piping
	P-DOMW-EQPM	Domestic hot and cold water equipment
	P-DOMW-HPIP	Domestic hot water piping
	P-DOMW-RISR	Domestic hot and cold water risers
◆	P-EQPM	Plumbing - miscellaneous equipment
	P-FIXT	Plumbing fixtures, toilets, sinks

P-SANR	Sanitary drainage
P-SANR-EQPM	Sanitary equipment
P-SANR-FIXT	Plumbing fixtures
P-SANR-FLDR	Floor drains
P-SANR-PIPE	Sanitary piping
P-SANR-RISR	Sanitary risers
P-STRM	Storm drainage system
P-STRM-PIPE	Storm drain piping
P-STRM-RFDR	Roof drains
P-STRM-RISR	Storm drain risers

CORE	NAME	DESCRIPTION	LAYER
<b>Structural</b>			
	S-ANNO-TEXT	General Text	
	S-ANNO-SYMB	Symbols	
	S-ANNO-LEGN	Legends and schedules	
	S-ANNO-DIMS	Dimensions	
	S-ANNO-TTLB	Border and Title Block	
	S-ANNO-NOTE	Job Notes	
	S-BEAM	Beams	
◆	S-COLS	Columns	
	S-FNDN	Foundation	
	S-FNDN-PILE	Piles, drilled piers	
	S-FNDN-RBAR	Foundation reinforcing	
◆	S-GRID	Column grid	
	S-GRID-DIMS	Column grid dimensions	
	S-GRID-EXTR	Column grid outside building	
	S-GRID-IDEN	Column grid tags	
	S-GRID-INTR	Column grid inside building	
	S-WALL	Structural bearing or shear walls	
<b>Telecomm</b>			
	T-ANNO-TEXT	General Text	
	T-ANNO-SYMB	Symbols	
	T-ANNO-LEGN	Legends and schedules	
	T-ANNO-TTLB	Border and Title Block	
	T-ANNO-NOTE	Job Notes	
	T-CABL	Cable plan	
	T-DIAG	Diagram	
	T-EQPM	Equipment plan	
	T-JACK	Data/telephone jacks	
	T-JACK-AP	Wireless Access Point	
	T-JACK-CAM	Security camera	
	T-JACK-MISC	Nurse call, BMS, elevator phone, metre clock circuit, Hydro utility metre, Bell, panic button, etc.	
	T-JACK-VD	Voice/Data	

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