



Facility Management Standard (FMSFIE)

for facilities, infrastructure, & environment

Implementation Guide

Version 2.0

Date – September 27, 2004

The CADD/GIS Technology Center
For facilities, infrastructure, and environment
Information Technology Laboratory
U.S. Army Engineer Research and Development Center
Vicksburg, Mississippi

Background

Initial development of the FMSFIE began in 1997. An underlying criteria for development of the FMSFIE has been to provide integration with the CADD/GIS Technology Center's CADD (AEC CADD Standard) and GIS (SDSFIE) data standards. Several different strategies were evaluated for integration of the FMSFIE within the SDSFIE and A/E/C CADD Standard. It was determined that, initially, the FMSFIE would be incorporated within the SDSFIE data model (designated as FM Entity Classes within the appropriate SDSFIE Entity Sets). This stage of FMSFIE development focused on: (1) Development of "business" FM, "event," and temporal information (e.g., construction, operation, maintenance, repair, and inspection records) concerning the "real-world" features/objects depicted in the SDSFIE and Architectural, Engineering, and Construction (A/E/C)/CADD Standard, and (2) Development of the capability to link to and share data with "corporate" databases, computerized information management systems, computer maintenance management systems, and commercially available FM software.

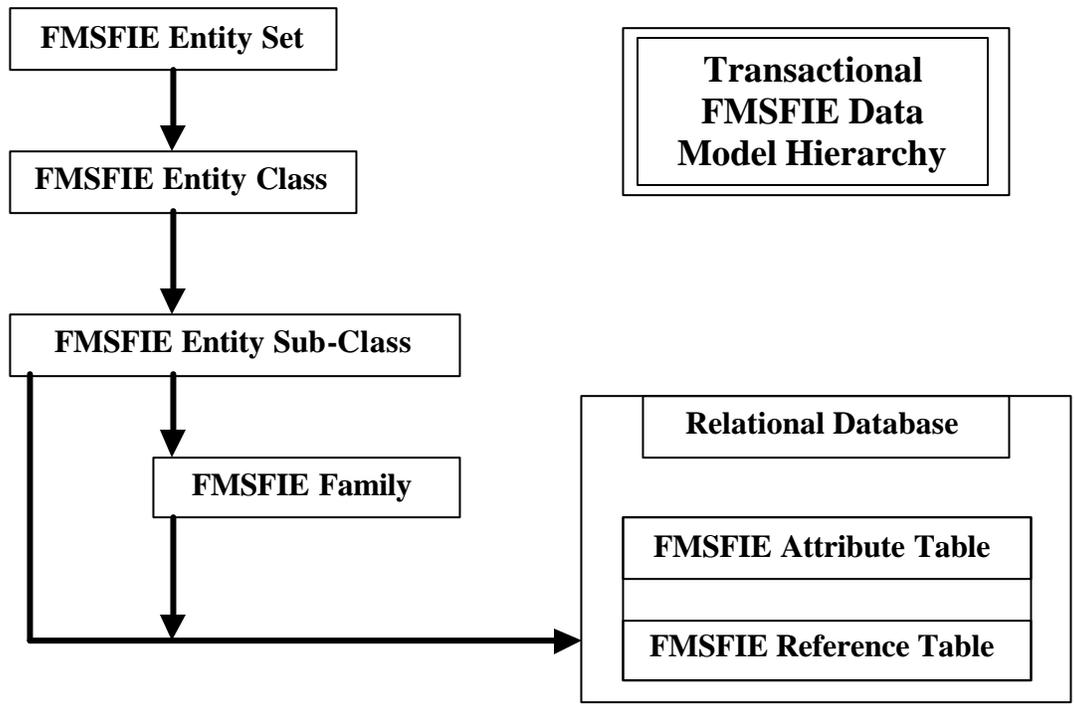
The first release of the FMSFIE (formerly called Tri-Service Facility Management Standards (TSFMS), and Facility Management Standards (FMS)) was published with Release 1.80 of the SDSFIE (formerly called Tri-Service Spatial Data Standards (TSSDS)) in February 1999.

In Fiscal Year 2000, the CADD/GIS Technology Center's Standards Working Group (SWG) and Corporate Staff (CS) approved a FMSFIE development Strategic Plan (<http://tsc.wes.army.mil/products/tssds-tsfms/fms/projects/fmsfiepr.htm>), which provided a framework and strategy for evolution of the FMSFIE to a more robust "transactional" data model closely integrated with the SDSFIE & A/E/C CADD Standard. Development of the "transactional" FMSFIE data model and standard began in Fiscal Year 2000, with an initial focus on Asset Management. Its first release was included in the FMSFIE Release 2.30, completed in October 2003.

The transactional FMSFIE defines a data model and data dictionary for facility management legal and Federal data reporting requirements encompassing the areas of asset management, work management, environmental management, public safety management, organization management, information security management, and financial management. In addition, the design of the FMSFIE will facilitate the sharing of data between various facility management (FM) information management systems (IMS) (e.g., Army Integrated Facilities System (IFS), Air Force Interim Work Information Management System (IWIMS), Air Force Automated Civil Engineer System (ACES), Navy Facility Assets Data Base (NFADB), Army Corps of Engineers Facilities and Maintenance System (FEM), and OSD RPES).

Like the SDSFIE, the transactional FMSFIE is being designed for implementation using commercially available relational database software (e.g., Oracle and SQL Server) and a Microsoft Windows Operating System (e.g., Windows 2000, XP, & NT). The FMSFIE is non-proprietary, thereby permitting other organizations, contractors, and vendors the ability to freely use the data schema and data dictionary, share FMSFIE compliant data with other organizations, and build applications based upon the FMSFIE data schema.

FMSFIE Data Model Hierarchy



Organization

FMSFIE Entity Set - Broad grouping of real property management responsibilities.

FMSFIE Entity Class – Sub-grouping of an Entity Set providing a grouping of similar real property classifications based on legal reporting requirements.

FMSFIE Entity Sub-Class – Sub-grouping of an Entity Class based on similar life-cycle event and temporal real property information.

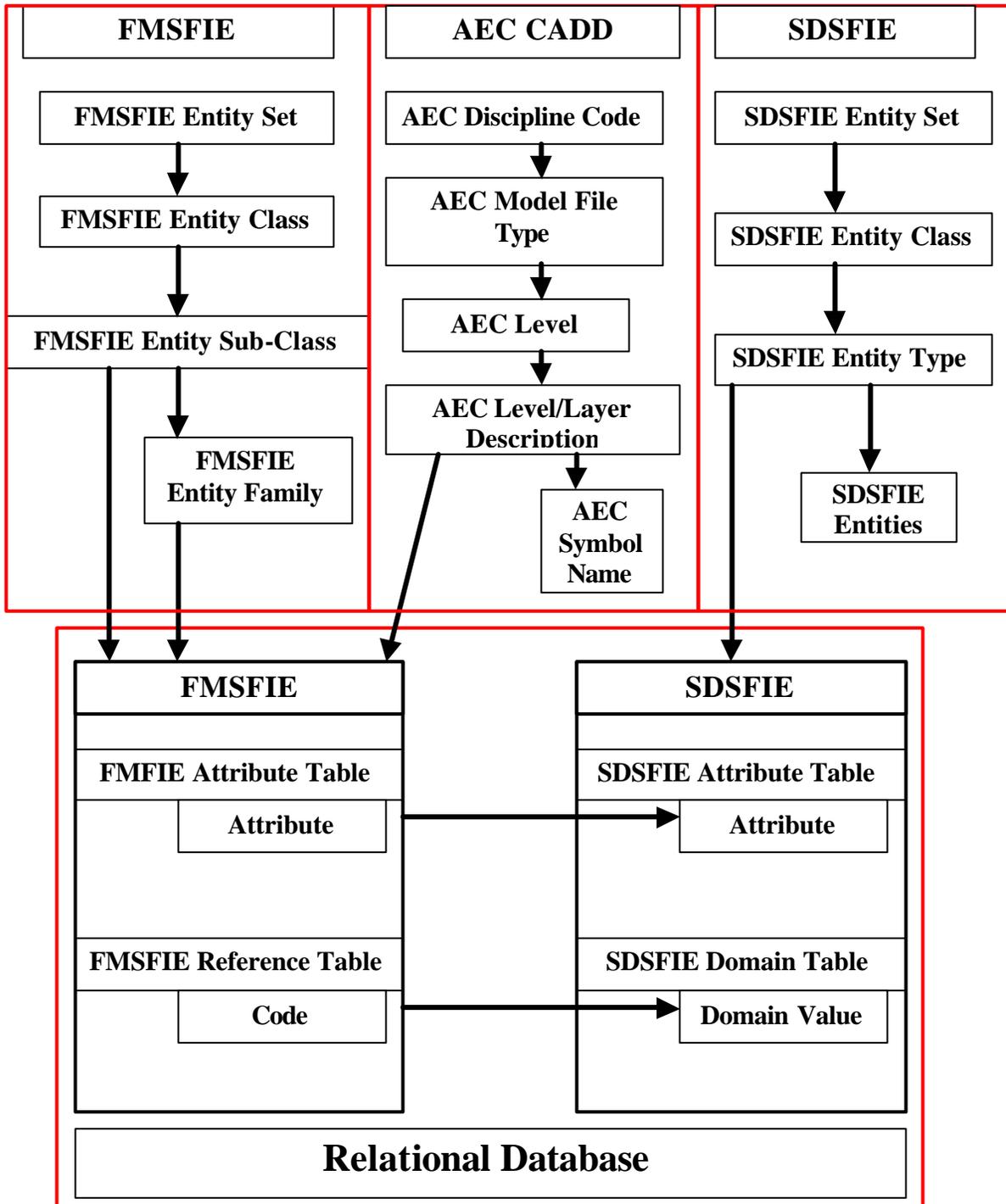
FMSFIE Entity Family – A functional sub-group of the Entity Sub-Class corresponding to different business disciplines, or different perspectives in the way the data is structured below the Entity Sub-Class.

Database

Attribute Table – Relational database table comprising a grouping of similar records. Also called a data table.

Reference Table – Relational database table containing a listing of valid, permissible, or reference values.

CADD/GIS/FM Standards Development Data Model



Use of Object Tables

OBJECT TABLES

Object tables are “cross-reference” tables that centralize the same type of data for many different object types. For example, a door, window, and roof may each have a height, width, and length. At Site A, they want to track the length and width for doors and nothing for windows and roofs. At Site B, they want to track everything for doors, windows, and roofs. Instead of a field for each of these measurements in each of the door, window, and roof tables, all of these values can be maintained in one table where the type of measurement and the object (e.g., DOOR, WINDOW, and ROOF) is specified. This table design provides efficiency by only storing those measurements that have values and flexibility by tracking only those measurements required. In addition, this approach keeps the parent tables (e.g., DOOR, WINDOW, and ROOF) from having fields that are minimally used or not used.

For each Object table, there are at least four fields (attributes). Three of them are:

- Record Identifier (e.g., OBJ_MEASMNT_SAID) – A System Assigned Identifier (SAID) (also called AutoNumber) that is used as the Primary Key
- Object Type Identifier (OBJ_TYP_SAID) – A field that specifies the appropriate Object Type SAID (i.e. the SAID (e.g., 47) for the record designating the appropriate object’s table name (e.g., DOOR))
- Object Identifier (OBJ_SAID) – A field that specifies the identifier of the object (most of the time it is the primary key identifier from the object’s table)

Below is an example:

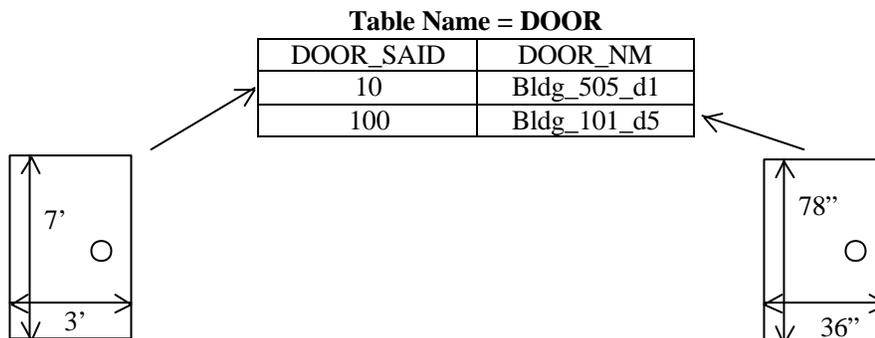


Table Name = WINDOW

WINDW_SAID	WINDW_NM
10	Bldg_101_w11

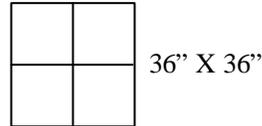
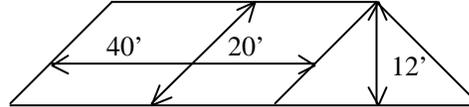


Table Name = ROOF

ROOF_SAID	ROOF_NM
1	RF_101



Reference Table Name = OBJECT_TYPE_REF

OBJ_TYP_SAID	OBJ_TYP_CD	OBJ_TYP_NM
47	DOOR	Door
141	WINDOW	Window
113	ROOF	Roof

Reference Table Name = MEASUREMENT_TYPE_REF

MEASMNT_TYP_SAID	MEASMNT_TYP_CD	MEASMNT_TYP_NM
1	WIDTH	Width
2	LENGTH	Length
4	HEIGHT	Height

Reference Table Name = UNIT_OF_MEASURE_REF

UOM_SAID	UOM_CD	UOM_NM
1	FT	Feet
3	IN	Inches

Object Table Name = OBJECT MEASUREMENT

Record Identifier	Object Type Identifier	Object Identifier	Measurement Type	Value	Unit of Measure
OBJ_MEASMNT_SAID	OBJ_TYP_SAID	OBJ_SAID	MEASMNT_TYP_SAID	MEASMNT_QY	UOM_SAID
1	47	10	2	7	1
2	47	10	1	3	1
3	47	100	2	78	3
4	47	100	1	36	3
5	141	10	2	36	3
6	141	10	1	36	3
7	113	1	2	40	1
8	113	1	1	20	1
9	113	1	4	12	1

Note that the Object Identifiers are the SAID's (System Assigned IDs), which are the primary keys from each of the Object Type's table. Also, if you were not using an object table you would need to add four fields to both the Door and Window table and six fields to the Roof table to accommodate the data.

In the model you will find various object tables. Below is a list of some, but not all of the object tables along with their fields, a description of the field, and an example.

Person Object Milestone – used for date and person information related to the lifecycle events of an object

FIELD (ATTRIBUTE)	DESCRIPTION	EXAMPLE
Record Identifier	system assigned value used as the primary key	persn_obj_milestn_said = 130
Event Type	event in the object's lifecycle	analyze
Object Type	type of object	sample
Object Identifier	unique identifier of the object	site #106
Person Object Type	type of person	non-employee
Person	unique identifier of the person	john doe
Actual Date	date the event occurred	4/2/03
Plan Date	date the event was planned to occur	4/1/03

Object Control Number – used for control number (serial, model, lot, ...) information related to an object

FIELD (ATTRIBUTE)	DESCRIPTION	EXAMPLE
Record Identifier	system assigned value used as the primary key	obj_ctrl_num_said = 140
Object Type	type of object	generator
Object Identifier	unique identifier of the object	standby generator bldg 2272
Control Number Type	type of control number	model number
Control Number Identifier	text value of the control number	S-1690-M

Object Cost – used for cost or dollar value information related to an object

FIELD (ATTRIBUTE)	DESCRIPTION	EXAMPLE
Record Identifier	system assigned value used as the primary key	obj_ct_said = 150
Object Type	type of object	asset
Object Identifier	unique identifier of the object	bldg 505
Cost Type	type of cost	current plant value
Cost Amount	amount of cost in dollars and cents	\$1,415,593.00

Object Feature – used for Boolean or similar type of information related to an object

FIELD (ATTRIBUTE)	DESCRIPTION	EXAMPLE
Record Identifier	system assigned value used as the primary key	obj_feat_said = 160
Object Type	type of object	asset
Object Identifier	unique identifier of the object	bldg 505
Feature Type	type of feature	has electricity

Object Location – used for location information related to an object

FIELD (ATTRIBUTE)	DESCRIPTION	EXAMPLE
Record Identifier	system assigned value used as the primary key	obj_loc_said = 170
Object Type	type of object	space
Object Identifier	unique identifier of the object	room 124
Location Object Type	type of location	asset
Location Object Identifier	unique identifier of the location	bldg 505

Object Note – used for comments, notes, memos, or long descriptive text information related to an object

FIELD (ATTRIBUTE)	DESCRIPTION	EXAMPLE
Record Identifier	system assigned value used as the primary key	obj_note_said = 180
Object Type	type of object	asset
Object Identifier	unique identifier of the object	bldg 505
Note Type	type of note	current plant value
Note	amount of cost in dollars and cents	\$1,415,593.00

Object Measurement – used for measurement information related to an object

FIELD (ATTRIBUTE)	DESCRIPTION	EXAMPLE
Record Identifier	system assigned value used as the primary key	obj_specifn_said = 190
Object Type	type of object	asset
Object Identifier	unique identifier of the object	bldg 505
Measurement Type	type of Measurement	area
Value	value of the specification	5430
Unit of Measure	unit of measure of the value	square feet

CONNECTION TO SDSFIE TABLES

The flexibility and capability of relational database technology permits connections, and sharing of data, between FMSFIE tables and Spatial Data Standard (SDSFIE) tables in several different ways. A recommended approach is described below:

SDSFIE - The attribute “facil_id”, is a Foreign Key (FK) in all SDSFIE “graphic” (and most “non-graphic”) tables. The “facil_id” FK links to the “Facility” table (table name = cmgenfac) in the SDSFIE “Common” Entity Set, “General” Entity Class.

FMSFIE – The attribute “ASSET_ID” is a User defined identifier in the FMSFIE “ASSET” table. The FMSFIE “ASSET_ID” field may be joined to the SDSFIE “facil_id” field as depicted below.

