NOTE – This is scanned copy of only those pages in the "FEMA Guidelines and Specifications for Flood Hazard Mapping Parters" report that document the S_BFE, S_CBRS, S_FIRM_PAN, S_FLD_HAZ_AR, S_FLD_HAZ_LN, S_GEN_STRUCT, S_PERM_BMK, and S_XS database tables. These tables were included in the final DFIRM database for Fairfield, Hartford, Middlesex, New Haven and New London counties.

Map MODERNIZATION

Federal Emergency Management Agency

FEMA's Flood Hazard Mapping Program

Guidelines and Specifications *for* Flood Hazard Mapping Partners

Appendix L: Guidance for Preparing Draft Digital Data and DFIRM Databas

FEDERAL EMERGENCY MANAGEMENT AGENCY

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Appendix L

Draft Digital Data and Digital Flood Insurance Rate Map Database Specifications

The purpose of this Appendix is to provide guidance and specifications to the Mapping Partner that prepares draft digital data for Digital Flood Insurance Rate Map (DFIRM) production and the Mapping Partner that prepares the Preliminary and Final DFIRM and databases for transfer to the Federal Emergency Management Agency (FEMA). For a particular Flood Map Project, the FEMA Lead may assign both tasks to one Mapping Partner or each task to different Mapping Partners. This Appendix is not intended to specify in-process compilation or digitizing procedures, but rather to present specifications and requirements for output and deliverables.

L.1 Digital Flood Insurance Rate Map Database Overview

The FEMA Geographic Information System (GIS) databases will store the digital data used in the map production process, as well as the engineering backup data for floodplain studies. These databases will provide a standard, systematic method for FEMA to distribute comprehensive details of flood studies to the public and others in a digital format.

Preparing these data in digital format has significant advantages. Digital data allow for more efficient storage, update, records search and distribution. The most significant advantage is that the data are designed to work within a GIS environment. This means that the FEMA database can be used for automated analyses that are costly and impractical with paper products and is compatible with Internet applications.

FEMA will collect as much data as possible in digital format, and archive the data in the GIS database for each DFIRM created. For publication of these data, FEMA will provide two versions of the DFIRM database. The simplified version is called the Standard DFIRM Database. The Standard DFIRM Database is provided to end users who do not require the complete engineering backup data; however, it is not intended to limit the scope of the GIS data collected and submitted to FEMA. The full GIS database that contains all of the available flood study information is called the Enhanced DFIRM Database

The Standard DFIRM Database was designed to present the effective flood hazard information published by FEMA. Users who only need to know whether a structure is in or out of the Special Flood Hazard Area (SFHA), or what the base flood elevation is for a location will be able to use the Standard DFIRM Database. Users who want to reference the engineering analyses or utilize any of the supporting data behind the effective flood hazard data will need to use the Enhanced DFIRM Database.

This Appendix includes the specification for the Standard DFIRM Database and the core elements of the Enhanced DFIRM Database. All of the Standard DFIRM Database information is contained within the Enhanced DFIRM Database. In the sections below that detail the database structure, some database fields and some database tables are identified as "Enhanced". That means these fields or tables are only included with full GIS database that is built for a particular study. They are not included in the easier to use version, the Standard DFIRM Database, that is also available for the same study.

The amount of data that will be captured digitally and stored in the Enhanced DFIRM Database will vary for each flood study. In general, the production of any digital map will result in a complete Standard DFIRM Database. However, most studies will also have some additional data that will be stored in the Enhanced DFIRM Database. Even studies where existing effective flood hazard analyses are used to produce updated digital maps may include easily accessible elements of the Enhanced DFIRM Database. For new studies where new flood hazard analyses are performed, the core elements of the Enhanced Database described will be populated. For each digital map update undertaken, the Mapping Partner should coordinate with the FEMA Lead to determine how much of the Enhanced DFIRM Database should be completed.

For Preliminary or Final DFIRMs, all of the tables in the DFIRM database are required if they apply to the DFIRM being created. Some tables, like those that depict coastal features, do not apply to every DFIRM. The Mapping Partner that creates the DFIRM shall ensure that all of the applicable tables in the DFIRM database have been completed and documented in the metadata. Generally, the DFIRM database for a new DFIRM will cover the entire jurisdiction. Detailed specifications for the Preliminary or Final DFIRM database are provided in Section L.3. A summary of the standard DFIRM database tables is provided in Table L-1.

✓ = included

Table L-1. DFIRM Database Table Summary

DFIRM Table Name	Table Type	Table Description
L_Aux_Data	Lookup	Information about auxiliary data.
L_Case_Info	Lookup	Information about data specific to the study.
L_Comm_Info	Lookup	Information about each community on the DFIRM
L_Cst_Model	Lookup	Information about coastal models used in the engineering analysis.
L_Hydra_Model	Lookup	Information about hydraulic models used in the engineering analysis.
L_Hydro_Model	Lookup	Information about hydrologic models used in the engineering analysis.
L_Media	Lookup	Information about archived media that is linked to a spatial object.
L_MT1_LOMC	Lookup	Information about LOMCs on the DFIRM
L_Node_Disch	Lookup	Information about hydrologic routing.
L_Pan_Revis	Lookup	Information about revisions to each FIRM panel
L_Pol_FHBM	Lookup	Information about revisions to FHBMs for each community
L_Regression	Lookup	Information about regression equations utilized in the hydrologic modeling.
L_Stn_Start	Lookup	Location and attributes for starting points for stream distance measurements
L_Storm_Curve	Lookup	Information about Depth-Duration-Frequency and Intensity-Duration-Frequency relationships.
L_Storm_Info	Lookup	Information about basic precipitation patterns.
L_Subbas_Disch	Lookup	Information about outflow data for each subbasin and recurrence interval in the hydrologic analysis.
L_Wtr_Nm	Lookup	Information about hydrographic features on the DFIRM
L_XS_Ratings	Lookup	Information about cross sections.
S_Base_Index	Spatial	Location and attributes for a tiling index for raster data used for the DFIRM
S_BFE	Spatial	Location and attributes for base flood elevations lines shown on DFIRM
S_CBRS	Spatial	Location and attributes for Coastal Barrier Resource System units on the DFIRM
S_Cst_Gage	Spatial	Location and attributes for the coastal gages for the study area.
S_Cst_Tsct_Ln	Spatial	Location and attributes for coastal transect lines shown on the DFIRM
S_FIRM_Pan	Spatial	Location and attributes for DFIRM hardcopy map panels
S_Fld_Haz_Ar	Spatial	Location and attributes for flood insurance risk zones on the DFIRM
S_Fld_Haz_Ln	Spatial	Location and attributes for boundaries of flood insurance risk zones on the DFIRM
S_Gen_Struct	Spatial	Location and attributes for flood control structures shown on the DFIRM
S_Label_Ld	Spatial	Location and attributes for leader lines on transportation and hydrography labels shown on the DFIRM
S_Label_Pt	Spatial	Location and attributes for transportation and hydrography labels shown on the DFIRM
S_LOMR	Spatial	Location and attributes for LOMRs on the DFIRM
S_Nodes	Spatial	Location and attributes of points used to define the topology of the hydrologic network.
S_Ovrbnkln	Spatial	Location and attributes for the overbank flow lines features for the study area.
S_Perm_Bmk	Spatial	Location and attributes for bench marks on the DFIRM
S_PFD_Ln	Spatial	Location and attributes for the primary frontal dune features for the coastal study area.
S_PLSS_Ar	Spatial	Location and attributes of sections, townships and ranges on the DFIRM
S_PLSS_Ln	Spatial	Location and attributes section lines, township lines and range lines on

		the DFIRM
S_Pol_Ar	Spatial	Location and attributes for political jurisdictions shown on the DFIRM
S_Pol_Ln	Spatial	Location and attributes for political boundaries shown on the DFIRM
S_Precip_Gage	Spatial	Location and attributes for rain gages used in developing the hydrologic analysis.
S_Profil_Basln	Spatial	Location and attributes for profile baseline and stream centerline features for the study area.
S_Quad_Index	Spatial	Location and attributes for USGS quadrangle maps covering the DFIRM area
S_Riv_Mrk	Spatial	Location and attributes for river mile markers shown on the DFIRM
S_Shore_Ln	Spatial	Location and attributes for the shoreline used in the coastal flood hazard model.
S_Stn_Start	Spatial	Location and attributes for station points.
S_Subbasins	Spatial	Location and attributes for subbasins in the hydrologic analysis.
S_Trnsport_Ln	Spatial	Location and attributes for roads, railroads and other transportation features shown on the DFIRM
S_Water_Gage	Spatial	Location and attributes for non-rain gages used in developing the hydrologic analysis.
S_Wtr_Ar	Spatial	Location and attributes for hydrography features shown on DFIRM
S_Wtr_Ln	Spatial	Location and attributes for hydrography features shown on DFIRM
S_XS	Spatial	Location and attributes for cross-section lines in the area covered by the DFIRM
Study_Info	Non-Spatial	General information about the DFIRM

Mapping Partners that are assigned other tasks for a Flood Map Project will normally produce draft study components and draft DFIRM digital data. For Mapping Partners that create draft DFIRM digital data, not all the tables in the DFIRM database will apply. These Mapping Partners will often only submit data that cover the geographic area of their work. The tables that are applicable to a specific Flood Map Project will vary, depending on the specific scope of that activity. Table L-2 presents the DFIRM database tables that apply to specific components of a Flood Map Project. The scope of a particular project could include several of these activities and, therefore, all of the tables from each of the activities involved in the project will likely apply. Most Flood Map Projects will include the requirement of a digital base map that meets the requirements as outlined in Appendix K of these Guidelines.

Table L-2. Mapping Partner Activity Table

Digital FIRM Preparation	Digital FIRM Maintenance	Hydrologic and Hydraulic Analyses and Floodplain Mapping	Redelineation of Floodplain Boundaries Using Updated Topographic Data	Refinement of Approximate Zone A Boundaries	Digital Topographic Data Development	Coastal Hazard Analyses and Floodplain Mapping	Digital Base Map Development
L_Aux_Data	L_Aux_Data	L_Aux_Data	L_Aux_Data	L_Wtr_Nm	S_Perm_Bmk	L_Aux_Data	L_Wtr_Nm
L_Case_Info	L_Case_Info	L_Case_Info	L_Case_Info	S_Fld_Haz_Ar		L_Cst_Model	S_Base_Index
L_Comm_Info	L_Comm_Info	L_Hydra_Model	L_Hydra_Model	S_Fld_Haz_Ln		L_Media	S_Gen_Struct
L_Cst_Model	L_Cst_Model	L_Hydro_Model	L_Hydro_Model	S_LOMR		L_Wtr_Nm	S_Label_Ld
L_Hydra_Model	L_Hydra_Model	L_Media	L_Media	S_Perm_Bmk		S_BFE	S_Label_Pt
L_Hydro_Model	L_Hydro_Model	L_Node_Disch	L_Node_Disch	S_Wtr_Ar		S_CBRS	S_Perm_Bmk
L_Media	L_Media	L_Regression	L_Regression	S_Wtr_Ln		S_Cst_Gage	S_PLSS_AR
L_MT1_LOMC	L_MT1_LOMC	L_Stn_Start	L_Stn_Start			S_Cst_Tsct_Ln	S_PLSS_LN
L_Node_Disch	L_Node_Disch	L_Storm_Curve	L_Storm_Curve			S_Fld_Haz_Ar	S_Pol_Ar
L_Pan_Revis	L_Pan_Revis	L_Storm_Info	L_Storm_Info			S_Fld_Haz_Ln	S_Pol_Ln
L_Pol_FHBM	L_Pol_FHBM	L_Subbas_Disch	L_Subbas_Disch			S_Gen_Struct	S_Quad_Index
L_Regression	L_Regression	L_Wtr_Nm	L_Wtr_Nm			S_LOMR	S_Trnsport_Ln
L_Stn_Start	L_Stn_Start	L_XS_Ratings	L_XS_Ratings			S_Perm_Bmk	S_Wtr_Ar
L_Storm_Curve	L_Storm_Curve	S_BFE	S_BFE			S_PFD_Ln	S_Wtr_Ln
L_Storm_Info	L_Storm_Info	S_Fld_Haz_Ar	S_Fld_Haz_Ar			S_Shore_Ln	
L_Subbas_Disch	L_Subbas_Disch	S_Fld_Haz_Ln	S_Fld_Haz_Ln			S_Wtr_Ar	
L_Wtr_Nm	L_Wtr_Nm	S_Gen_Struct	S_Gen_Struct			S_Wtr_Ln	
L_XS_Ratings	L_XS_Ratings	S_LOMR	S_LOMR				
S_Base_Index	S_Base_Index	S_Nodes	S_Nodes				
S_BFE	S_BFE	S_Ovrbnkln	S_Ovrbnkln				
S_CBRS	S_CBRS	S_Perm_Bmk	S_Perm_Bmk				
S_Cst_Gage	S_Cst_Gage	S_Precip_Gage	S_Precip_Gage				
S_Cst_Tsct_Ln	S_Cst_Tsct_Ln	S_Profil_Basln	S_Profil_Basln				
S_FIRM_Pan	S_FIRM_Pan	S_Riv_Mrk	S_Riv_Mrk				
S_Fld_Haz_Ar	S_Fld_Haz_Ar	S_Stn_Start	S_Stn_Start				
S_Fld_Haz_Ln	S_Fld_Haz_Ln	S_Subbasins	S_Subbasins				
S_Gen_Struct	S_Gen_Struct	S_Water_Gage	S_Water_Gage				
S_Label_Ld	S_Label_Ld	S_Wtr_Ar	S_Wtr_Ar				
S_Label_Pt	S_Label_Pt	S_Wtr_Ln	S_Wtr_Ln				
S_LOMR	S_LOMR	S_XS	S_XS				
S_Nodes	S_Nodes						
S_Ovrbnkln	S_Ovrbnkln						
S_Perm_Bmk	S_Perm_Bmk						

S_PFD_Ln	S_PFD_Ln						
S_PLSS_Ar	S_PLSS_Ar						
S_PLSS_Ln	S_PLSS_Ln						
S_Pol_Ar	S_Pol_Ar						
S_Pol_Ln	S_Pol_Ln						
S_Precip_Gage	S_Precip_Gage						
S_Profil_Basln	S_Profil_Basln						
S_Quad_Index	S_Quad_Index						
S_Riv_Mrk	S_Riv_Mrk						
S_Shore_Ln	S_Shore_Ln						
S_Stn_Start	S_Stn_Start						
S_Subbasins	S_Subbasins						
S_Trnsport_Ln	S_Trnsport_Ln						
S_Water_Gage	S_Water_Gage						
S_Wtr_Ar	S_Wtr_Ar						
S_Wtr_Ln	S_Wtr_Ln						
S_XS	S_XS						
Study_Info	Study_Info						

Database Design Decisions

To facilitate the ease of use of the DFIRM database, FEMA will avoid the use of abbreviations and codes in the published data where feasible.

Where possible, all mapping and engineering data elements will be linked to physical geographic features that are georeferenced. A GIS has the ability to precisely overlay the mapping and engineering data. This approach supports a wide variety of existing and visionary FEMA engineering and mapping products, such as digital mapping; automated hydrologic and hydraulic modeling, automated mapping, web-based publishing, and direct links between modeling and mapping elements.

The DFIRM database is not intended to be used to produce an exact replica of the printed Flood Insurance Rate Map (FIRM). Instead, the DFIRM database is designed to allow a GIS user access to all of the information conveyed on the FIRM in a way that can best take advantage of the automated analysis capabilities of GIS. FEMA will provide a companion product in the form of a scanned or raster image of the hardcopy DFIRM that will allow users to reprint exact replicas of the whole FIRM or portions of the FIRM.

The DFIRM database will be designed to be usable in a standard Relational Database Management System (RDBMS), but will be software independent. Therefore, the products are defined as flat tables in public domain formats (e.g., ESRI Shapefiles, MapInfo MIF files). Users can import these formats into a wide variety of software packages. These file formats manage GIS data in discrete files, generally organized by data theme. As a result, they do not support the inter-table relationships and data integrity enforcement capabilities of an RDBMS. However, the data produced by FEMA will be designed, tested to follow these rules, and fully compatible with an RDBMS.

L.1.1 Spatial Data and Tabular Data

The complete DFIRM database product is a GIS database made up of spatial data describing the location of features on the earth and tabular data that describe the attributes of these spatial features. The tables described in Sections L.4 and L.7 that begin with "S_" have a spatial component associated with them.

FEMA will distribute Preliminary and Final DFIRM databases to end users in GIS formats where the links between the spatial data and the attribute data are inherent in the data structure.

L.1.2 Draft Digital Data Versus Preliminary and Final Digital Flood Insurance Rate Map Databases

To facilitate the submittal of digital flood hazard mapping data from all Mapping Partners, FEMA has established more flexible requirements for submitting draft DFIRM digital data than for Preliminary or Final DFIRM databases. Sections L.2 and L.4 provide options for submitting draft DFIRM spatial data in a Computer Assisted Drafting and Design (CADD) structure or a GIS structure. Mapping Partners preparing draft DFIRM data have the option of using one of the draft data formats or using the Preliminary or Final DFIRM database format described in L.3 and L.7. The Mapping Partner preparing draft DFIRM data should choose the option that works best for the project. Mapping Partners preparing Preliminary or Final DFIRM databases must follow the format described in L.3 and L.7.

Section L.4 also provides an option for the attribute table structure for DFIRMs that employs a more sophisticated relational structure. This option allows Mapping Partners that create draft DFIRM digital data to take advantage of relational database techniques to ensure data consistency and reduce database size. The Preliminary and Final DFIRM Databases have a simpler structure for ease of use by the general public. The primary difference between the draft table structure and the Preliminary and Final table structure is that domain tables are used in the draft structure and are not used in the Preliminary and Final structure.

The following discussion highlights the differences between the attribute table structure option available for draft DFIRM digital data and the attribute table structure for Preliminary and Final DFIRM Databases. Domain tables (tables in the database that begin with D_) were established to assist FEMA's Mapping Partners in the creation of the draft DFIRM database. These domain tables provide the Mapping Partner with valid or preferred attribute values for specific fields. A domain table also helps minimize entry differences by standardizing the value. For example, without domain tables, one user might enter "floodway" while another user might enter "FLDWY" while completing the FLOODWAY field in the S_Fld_Haz_Ar table. While both of these entries reflect the same idea, the inconsistency between the two forms makes it difficult to group similar features together. Using a domain table ensures that both users enter the same value (i.e., floodway) to describe the same feature. To capture local characteristics not included in the domain table, Mapping Partners also may add and use their own values in the domain table (e.g., a more restrictive locally regulated floodway could be added to the accepted domain values as "Local Floodway"). An example of a domain table is shown in Table L-3.

Table L-3. Sample Domain Table

FLDWAY_LID	FLOODWAY
1000	FLOODWAY
1010	COLORADO RIVER
1020	FLOODWAY CONTAINED IN CHANNEL
1030	FLOWAGE EASEMENT BOUNDARY
1040	STATE ENCROACHMENT
1050	AREA OF SPECIAL CONSIDERATION

Field names that end with "_LID" in the draft DFIRM specification (e.g., FLDWAY_LID) link to a domain table. The "_LID" field contains an integer that matches a value in the first field of the corresponding domain table. The second field of the domain table provides a more descriptive attribute value. In the Preliminary or Final DFIRM database, the "_LID" field is replaced by the second field from the domain table (i.e., FLOODWAY). The attribute value stored in the Preliminary or Final DFIRM database is the descriptive attribute value, rather than an integer. The domain tables are not included in the Preliminary or Final DFIRM database. The Mapping Partner creating draft digital data and using domain tables to create the S_Fld_Haz_Ar table, will enter "1000" in that table as the FLDWAY_LID value. In this instance, "1000" stands for "FLOODWAY." When the Preliminary or Final DFIRM database is created, the FLDWAY_LID field becomes FLOODWAY, and the record value of "1000" becomes "FLOODWAY".

When creating the Preliminary or Final DFIRM database, the assigned Mapping Partner shall treat the water name lookup table (L_Wtr_Nm) in the draft DFIRM digital data table structure option as a domain table. The surface water feature names stored in the lookup table must be transferred to related fields in other tables.

L.2 Preparation of Draft Digital Data

L.2.1 General

If the Mapping Partner that creates the draft study components also produces the Preliminary Flood Insurance Study (FIS) report and FIRM, that Mapping Partner does not need to produce separate digital FIS data for the draft study components. Instead, the Mapping Partner will typically be responsible for creating a Preliminary or Final DFIRM database as described in Volume 1, Subsection 1.4.6.6 of these Guidelines and in Section L.3.

The main issues that the assigned Mapping Partner shall consider in the preparation of the digital data are:

- Coordination;

Table: S_BFE

The Base Flood Elevation (BFE) table is required for any digital data where BFE lines will be shown on the corresponding Flood Insurance Rate Map (FIRM). Normally if there are any riverine AE zones, BFE lines are required.

The S_BFE table contains information about the BFEs within a study area. A spatial file with locational information also corresponds with this data table. BFE lines indicate the rounded whole-foot water surface elevation of the 1-percent-annual-chance flood.

The spatial elements representing BFE features are lines extending from Special Flood Hazard Area (SFHA) boundary to SFHA boundary. The BFE lines will have no visible gaps or overshoots between the SFHA boundary and the end of the BFE line at the publication scale of the DFIRM. However, the ends of the BFE lines are not necessarily snapped precisely to the SFHA boundary. Each BFE is represented by a single line. While BFE lines are depicted as wavy lines on the hardcopy FIRM, they should be primarily straight lines in the spatial data, although they may bend consistent with procedures described in Volume 1 of these Guidelines.

This is a Standard DFIRM Database table.

The S_BFE table contains the following elements.

BFE_LN_ID	R	S	Primary key for table lookup. Assigned by table creator.
ELEV	R	S	BFE. The rounded, whole-foot elevation of the 1-percent-annual-chance flood. This is the value of the BFE that is printed next to the BFE line on the FIRM.
LEN_UNIT	R	S	BFE Units. This unit indicates the measurement system used for the BFEs. Normally this would be feet. Acceptable values for this field are listed in the D_Length_Units table.
V_DATUM	R	S	Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally this would be North American Vertical Datum of 1988 for new studies. Acceptable values for this field are listed in the D_V_Datum table.
SOURCE_CIT	R	S	Source Citation. Abbreviation used in the metadata file when describing the source information for the S_BFE table.

Table: S_BFE

Field	R/A	S/E	MS Access					ESRI Shapefile			ESRI Coverage				MapInfo		
			type	field size	dec	format	input mask	type	width	dec	type	item width	output width	dec	type	width	dec
BFE_LN_ID	R	S	text	11				string	11		character	11	11		character	11	
ELEV	R	S	number (double)	8	2			number	13	2	numeric	8	13	2	decimal	15	2
LEN_UNIT	R	S	text	20				string	20		character	20	20		character	20	
V_DATUM	R	S	text	6				string	6		character	6	6		character	6	
SOURCE_CIT	R	S	text	11				string	11		character	11	11		character	11	

Table: S_CBRS

This table only applies to coastal areas that have specially protected areas designated by Congress on John H. Chafee Coastal Barrier Resources System (CBRS) maps. Authoritative CBRS boundary locations are shown on these maps administered by the U.S. Fish and Wildlife Service. Normally these areas are already shown on existing Federal Emergency Management Agency (FEMA) maps for the area. CBRS areas have restrictions on Federal funding (including flood insurance coverage) after specified dates for new or substantially improved structures. See Section 2.2 and Appendix K of these Guidelines for more detailed information about CBRS areas.

The S_CBRS table contains information about the CBRS areas within the study area, if applicable. A spatial file with locational information also corresponds with this data table.

The spatial elements representing CBRS features are closed polygons. Each contiguous CBRS area of the same CBRS_TYP and same CBRS_DATE must be a single polygon.

This is a Standard DFIRM Database table.

The S_CBRS table contains the following elements.

CBRS_ID	R	S	Primary key for table lookup. Assigned by table creator.
CBRS_TYP	A	S	CBRS Type. The type code provides details of the types of prohibitions that apply to the area. Normally this would be a CBRS area or Otherwise Protected Area (OPA). Acceptable values for this field are listed in the D_CBRS_Type table. This field is applicable if CBRS_TF is true. Otherwise this field is null.
CBRS_DATE	A	S	CBRS Date. Legislative or administrative date on which prohibitions for the CBRS area apply. This must be indicated on the Flood Insurance Rate Map with a note or with a fill pattern indicated on the legend. This field is applicable if CBRS_TF is true. Otherwise this field is null.
CBRS_TF	R	S	This field is True if the area is a CBRS or an OPA. Enter "T" for true or "F" for false.
SOURCE_CIT	R	S	Source Citation. Abbreviation used in the metadata file when describing the source information for the S_CBRS table.

Table: S_CBRS

Field	R/A	S/E	MS Access					ESRI Shapefile			ESRI Coverage				MapInfo		
			type	field size	dec	format	input mask	type	width	dec	type	item width	output width	dec	type	width	dec
CBRS_ID	R	S	text	11				string	11		character	11	11		character	11	
CBRS_TYP	A	S	text	35				string	35		character	35	35		character	35	
CBRS_DATE	A	S	date/time	8		yyyymmdd	00/00/0000	date			date	8	10		date		
CBRS_TF	R	S	text	1				string	1		character	1	1		character	1	
SOURCE_CIT	R	S	text	11				string	11		character	11	11		character	11	

Table: S_FIRM_Pan

This table is required for all preliminary or final DFIRM databases.

The S_FIRM_Pan table contains information about the Flood Insurance Rate Map (FIRM) panel area. A spatial file with locational information also corresponds with this data table.

The spatial entities representing FIRM panels are polygons. The polygon for the FIRM panel corresponds to the panel neatlines. As a result, the panels are generally rectangular. In situations where a portion of a panel lies outside of the jurisdiction being mapped, the user must refer to the S_POL_AR table to determine the portion of the panel area where the DFIRM database shows the effective flood hazard data for the mapped jurisdiction.

This is a Standard DFIRM Database table.

The S_FIRM_Pan table contains the following elements.

FIRM_ID	R	S	Primary key for table lookup. Assigned by table creator.
ST_FIPS	R	S	State FIPS. This is the two-digit code that corresponds to the state Federal Information Processing Standard (FIPS) code. This is a standard numbering system that is used by the Federal government. Defined in FIPS Pub 6-4. These two numbers correspond to the first two digits of the panel number.
PCOMM	R	S	Community or County Identification Number. This is the 3rd through the 6th digits of the panel number. For community based maps this corresponds to the Federal Emergency Management Agency (FEMA) Community Identification number. For countywide maps this is the county (or county equivalent) FIPS code with a "C".
PANEL	R	S	Panel Number. This is 7th through the 10th digits in the complete panel number. This is assigned by the scale of the map and the position within the community or county. The panel number scheme is described in detail in Appendix K of these Guidelines.
SUFFIX	R	S	Map Suffix. This is the final digit in the complete panel number. This is a letter suffix at the end of the panel number.
FIRM_PAN	R	S	FIRM Panel Number. This is the complete FIRM panel number, which is made up of ST_FIPS, PCOMM, PANEL, and SUFFIX. This is the 11-digit FIRM panel number that is shown in the title block of the map.
PANEL_TYP	R	S	Panel Type. The type of FIRM panel that identifies whether the panel is printed or not printed and whether it is community based or

countywide mapping. Acceptable values for this field are listed in the D_Panel_Typ table.

EFF_DATE	A	S	Effective Date. This is the effective date of the current map revision. This field is not populated until the FIRM effective date is established and the Final FIRM is ready for hardcopy production by FEMA. Then it is required.
SCALE	R	S	Map Scale. This is the denominator of the FIRM scale as a ratio. For example, 24000 is the denominator for a 1" = 2000' map. Acceptable values for this field are listed in the D_Scale table.
PNP_REASON	A	S	Panel Not Printed Reason. This is the explanation of the reason for the FIRM panels that are not printed. See Appendix K of these Guidelines for a listing of Panel Not Printed reasons that may be used. Only completed if the hardcopy panel is not printed by FEMA.
NW_LAT	R	S	Northwest Latitude. This is the latitude of the northwest corner of the FIRM panel neatline. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to U.S. Geological Survey (USGS) 7.5' quadrangle maps using North American Datum of 1983 (NAD83), or even subdivisions thereof. However this value must reflect the actual latitude if non-standard panel sizes are used.
NW_LONG	R	S	Northwest Longitude. This is the longitude of the northwest corner of the FIRM panel. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to USGS 7.5' quadrangle maps using NAD83, or even subdivisions thereof. However this value must reflect the actual longitude if non-standard panel sizes are used.
SE_LAT	R	S	Southeast Latitude. This is the latitude of the southeast corner of the FIRM panel. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to USGS 7.5' quadrangle maps using NAD83, or even subdivisions thereof. However this value must reflect the actual latitude if non-standard panel sizes are used.
SE_LONG	R	S	Southeast Longitude. This is the longitude of the southeast corner of the FIRM panel. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to USGS 7.5' quadrangle maps using NAD83, or even subdivisions thereof. However this value must reflect the actual longitude if non-standard panel sizes are used.

SOURCE_CIT	R	S	Source Citation. Abbreviation used in the metadata file when describing the source information for the S_FIRM_Pan table.

Table: S_FIRM_Pan

Field	R/A	R/A	MS Access					ESRI Shapefile			ESRI Coverage				MapInfo		
			type	field size	dec	format	input mask	type	width	dec	type	item width	output width	dec	type	width	dec
FIRM_ID	R	S	text	11				string	11		character	11	11		character	11	
ST_FIPS	R	S	text	2				string	2		character	2	2		character	2	
PCOMM	R	S	text	4				string	4		character	4	4		character	4	
PANEL	R	S	text	4				string	4		character	4	4		character	4	
SUFFIX	R	S	text	1				string	1		character	1	1		character	1	
FIRM_PAN	R	S	text	11				string	11		character	11	11		character	11	
PANEL_TYP	R	S	text	35				string	35		character	35	35		character	35	
EFF_DATE	A	S	date/time	8		yyyymmdd	00/00/0000	date			date	8	10		date		
SCALE	R	S	text	5				string	5		character	5	5		character	5	
PNP_REASON	A	S	text	50				string	50		character	50	50		character	50	
NW_LAT	R	S	text	15				string	15		character	15	15		character	15	
NW_LONG	R	S	text	15				string	15		character	15	15		character	15	
SE_LAT	R	S	text	15				string	15		character	15	15		character	15	
SE_LONG	R	S	text	15				string	15		character	15	15		character	15	

SOURCE_CIT	R	S	text	11				string	11		character	11	11		character	11	

Table: S_Fld_Haz_Ar

This table is required for all draft Digital Flood Insurance Rate Map data.

The S_Fld_Haz_Ar table contains information about the flood hazards within the study area. A spatial file with locational information also corresponds with this data table. These zones are used by the federal Emergency Management Agency (FEMA) to designate the Special Flood Hazard Area (SFHA) and for insurance rating purposes. These data are the flood hazard areas that are or will be depicted on the Flood Insurance Rate Map (FIRM). A spatial file with locational information also corresponds with this data table.

The spatial elements representing the flood zones are polygons. The entire area of the jurisdiction(s) mapped by the FIRM should have a corresponding flood zone polygon. There is one polygon for each contiguous flood zone designated.

This is a modified Standard DFIRM Database table that includes Standard DFIRM Database items and Enhanced Database items. All items after SOURCE_CIT are Enhanced.

The S_Fld_Haz_Ar table contains the following elements.

FLD_AR_ID	R	S	Primary key for table lookup. Assigned by table creator.
FLD_ZONE	R	S	Flood Zone. This is a flood zone designation. These zones are used by FEMA to designate the SFHAs and for insurance rating purposes. NOTE: The symbol '%' is a reserved symbol in most software packages so the word 'percent' was abbreviated to 'PCT'. Acceptable values for this field are listed in the D_Zone table.
FLOODWAY	A	S	Floodway Type. Floodway areas are designated by FEMA and adopted by communities to provide an area that will remain free of development to moderate increases in flood heights due to encroachment on the floodplain. Normal floodway areas are 'floodway'. Special cases will have a note on the hardcopy FIRM. If the corresponding area is not designated as a floodway, this field is null. Acceptable values for this field are listed in the D_Floodway table.
SFHA_TF	R	S	Special Flood Hazard Area. If the area is within SFHA this field would be True. This field will be true for any area that is coded for any A or V zone flood areas. It should be false for any X or D zone flood areas. Enter "T" for true or "F" for false.
STATIC_BFE	A	S	Static Base Flood Elevation. For areas of constant Base Flood Elevation (BFE), the BFE value is shown beneath the zone label rather than on a BFE line. In this situation the same BFE applies to the entire polygon. This is normally occurs in lakes or coastal

			zones. This field is only populated where a static BFE is shown on the FIRM.
V_DATUM	A	S	Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally this would be North American Vertical Datum of 1988 for new studies. This field is only populated if the STATIC_BFE field is populated. Acceptable values for this field are listed in the D_V_Datum table.
DEPTH	A	S	Depth Value for Zone AO Areas. This is shown beneath the zone label on the FIRM. This field is only populated if a depth is shown on the FIRM.
LEN_UNIT	A	S	Length Units. This unit indicates the measurement system used for the BFEs and/or depths. Normally this would be feet. This field is only populated if the STATIC_BFE or DEPTH field is populated. Acceptable values for this field are listed in the D_Length_Units table.
VELOCITY	A	S	Velocity Measurement. This is shown beneath the zone label on the FIRM for alluvial fan areas (certain Zone AO areas). This value represents the velocity of the flood flow in this area. This field is only populated when a velocity is shown on the FIRM.
VEL_UNIT	A	S	Unit of Measurement for the Velocity Attribute. This is shown in the legend where alluvial fans are present. This field is only populated if the VELOCITY field is populated. Acceptable values for this field are listed in the D_Velocity_Units table.
AR_REVERT	A	S	If the area is Zone AR, this field would hold the zone that the area would revert to if the AR zone were removed. This field is only populated if the corresponding area is Zone AR. Acceptable values for this field are listed in the D_Zone table.
BFE_REVERT	A	S	If Zone is Zone AR, this field would hold the static base flood elevation for the reverted zone. This field is populated when Zone equals AR and the reverted zone has a static BFE.
DEP_REVERT	A	S	If Zone is Zone AR, this field would hold that flood depth for the reverted zone. This field is populated when Zone equals AR and the reverted zone has a depth assigned.
SOURCE_CIT	R	S	Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Fld_Haz_Ar table. Normally, the flood hazard area polygon will be divided to distinguish areas modified by the most recent revision from areas based on the effective FIRM prior to the most recent revision. Revisions and sources prior to the most recent revision will not be

			tracked for individual polygons in the flood hazard areas table in the standard database.
HYDRO_ID	A	E	Hydrologic Model Identification. A code that provides a link to the hydrologic model table, L_Hydro_Model. The L_Hydro_Model table provides information on the methods used to determine the flood hazard for areas of shallow flooding and ponding. This ID field must contain a number that matches the HYDRO_ID field for a record in the L_Hydro_Model table. This attribute is only required for flood hazard areas with AO and AH zone designations or ponding associated with AE zones.
CST_MDL_ID	A	E	Coastal Model Identification. This field is populated by a linking element to the L_Cst_Model table. The L_Cst_Model table contains detailed information about the coastal models that were used to determine the coastal flood hazard for this area. This ID field must contain a number that matches the CST_MDL_ID field for a record in the L_Cst_Model table that documents coastal model information. This attribute is only required in areas for which flood hazard determinations do not consider wave hazards. The static BFE values in these areas are based on surge modeling and/or tidal analyses. When wave hazards are considered modeling information is linked to the transects used to complete the wave analysis.

Table: S_Fld_Haz_Ar

Field	R/A	S/E	MS Access					ESRI Shapefile			ESRI Coverage				MapInfo		
			type	field size	dec	format	input mask	type	width	dec	type	item width	output width	dec	type	width	dec
FLD_AR_ID	R	S	text	11				string	11		character	11	11		character	11	
FLD_ZONE	R	S	text	55				string	55		character	55	55		character	55	
FLOODWAY	A	S	text	30				string	30		character	30	30		character	30	
SFHA_TF	R	S	text	1				string	1		character	1	1		character	1	
STATIC_BFE	A	S	number (double)	8	2			number	13	2	numeric	8	13	2	decimal	15	2
V_DATUM	A	S	text	6				string	6		character	6	6		character	6	
DEPTH	A	S	number (double)	8	2			number	13	2	numeric	8	13	2	decimal	15	2
LEN_UNIT	A	S	text	20				string	20		character	20	20		character	20	
VELOCITY	A	S	number (double)	8	2			number	13	2	numeric	8	13	2	decimal	15	2
VEL_UNIT	A	S	text	20				string	20		character	20	20		character	20	
AR_REVERT	A	S	text	6				string	6		character	6	6		character	6	

BFE_REVERT	A	S	number (double)	8	2			number	13	2	numeric	8	13	2	decimal	15	2
DEP_REVERT	A	S	number (double)	8	2			number	13	2	numeric	8	13	2	decimal	15	2
SOURCE_CIT	R	S	text	11				string	11		character	11	11		character	11	
HYDRO_ID	A	E	text	11				string	11		character	11	11		character	11	
CST_MDL_ID	A	E	text	11				string	11		character	11	11		character	11	

Table: S_Fld_Haz_Ln

This table is required for all preliminary or final DFIRM databases.

The S_Fld_Haz_Ln table contains information about the flood hazard line features for the study area. A spatial file with locational information also corresponds with this data table.

The spatial elements representing the boundaries of the flood hazard areas depicted on the Flood Insurance Rate Map (FIRM) are lines.

This is a Standard DFIRM Database table.

The S_Fld_Haz_Ln table contains the following elements.

FLD_LN_ID	R	S	Primary key for table lookup. Assigned by table creator.
LN_TYP	R	S	Line Type. These line types describe the flood boundary and may be used to indicate how the feature must be depicted on the hardcopy FIRM. Acceptable values for this field are listed in the D_Ln_Typ table.

Table: S_Fld_Haz_Ln

Field	R/A	S/E	MS Access					ESRI Shapefile			ESRI Coverage				MapInfo		
			type	field size	dec	format	input mask	type	width	dec	type	item width	output width	dec	type	width	dec
FLD_LN_ID	R	S	text	11				string	11		character	11	11		character	11	
LN_TYP	R	S	text	45				string	45		character	45	45		character	45	

Table: S_Gen_Struct

This table is required whenever hydraulic structures are shown in the flood profile. It is also required if levees are shown on the FIRM, channels containing the flooding are shown on the FIRM, or any other structure that impacts the area's flood risk is shown on the FIRM.

The S_Gen_Struct table contains information about the hydraulic structures within the study area. It must include all structures shown in the flood profiles. In addition, levees, sea walls, channels that contain flooding, and other significant flood control structures shown on the Flood Insurance Rate Map (FIRM) must be included. A spatial file with locational information also corresponds with this data table.

Spatial elements representing general structures are represented by lines. The lines must represent the primary characteristic of the structure. For example, bridges must be represented by the transportation centerline carried by the bridge. Dams must be represented by a line corresponding to the top of the dam. Levees must be represented by a line corresponding to the top of levee. A line corresponding to the centerline of the main barrel must represent a culvert.

This is a Standard DFIRM Database table.

The S_Gen_Struct table contains the following elements.

STRUCT_ID	R	S	Primary key for table lookup. Assigned by table creator.
STRUCT_TYP	R	S	Structure Type. Hydraulic structures within the study area. Acceptable values for this field are listed in the D_Struct_Typ table.
STRUCT_NM	A	S	Structure Name. This is the name of the feature and the name that will be shown on the hardcopy FIRM. This record is left blank if the structure is not named on FIRM and/or the name is unknown.
WTR_NM	R	S	Surface Water Feature Name. This is the formal name of the surface water feature associated with the structure, as it will appear on the hardcopy FIRM.
SOURCE_CIT	R	S	Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Gen_Struct table.

Table: S_Gen_Struct

Field	R/A	S/E	MS Access					ESRI Shapefile			ESRI Coverage				MapInfo		
			type	field size	dec	format	input mask	type	width	dec	type	item width	output width	dec	type	width	dec
STRUCT_ID	R	S	text	11				string	11		character	11	11		character	11	
STRUCT_TYP	R	S	text	36				string	36		character	36	36		character	36	
STRUCT_NM	A	S	text	50				string	50		character	50	50		character	50	
WTR_NM	R	S	text	100				string	100		character	100	100		character	100	
SOURCE_CIT	R	S	text	11				string	11		character	11	11		character	11	

Table: S_Perm_Bmk

This table is required unless there are no National Geodetic Survey (NGS) or other bench marks that meet the minimum standard in the jurisdiction covered by the Flood Insurance Rate Map (FIRM).

The S_Perm_Bmk table contains information about Permanent Bench Marks that are associated with the study area. The bench marks shown in this file must meet the requirements specified in Subsection 1.4.1.4.1. A spatial file with locational information also corresponds with this data table.

The spatial entities representing bench marks are points. Generally, the assigned Mapping must place these points based on the coordinates in the NGS database. However, the horizontal coordinates maintained by the NGS for vertical bench marks is often not very precise because the users usually rely on the location descriptions to locate the bench marks. If the source of the horizontal coordinates used by the NGS is not precise, the Mapping Partner may adjust the position based on better available data.

This is a Standard DFIRM Database table.

The S_Perm_Bmk table contains the following elements.

BM_ID	R	S	Primary key for table lookup. Assigned by table creator.
PID	R	S	Permanent Identifier. This must be the NGS assigned or community assigned permanent identifier. It must be unique for each bench mark.
SOURCE_CIT	R	S	Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Perm_Bmk table.

Table: S_Perm_Bmk

Field	R/A	S/E	MS Access					ESRI Shapefile			ESRI Coverage				MapInfo		
			type	field size	dec	format	input mask	type	width	dec	type	item width	output width	dec	type	width	dec
BM_ID	R	S	text	11				string	11		character	11	11		character	11	
PID	R	S	text	11				string	11		character	11	11		character	11	
SOURCE_CIT	R	S	text	11				string	11		character	11	11		character	11	

Table: S_XS

This table is required for any Digital Flood Insurance Rate Map database where cross sections are shown on the Flood Insurance Rate Map (FIRM). Normally any FIRM that has associated flood profiles has cross sections.

The S_XS table contains information about cross section lines. A spatial file with locational information also corresponds with this data table. These lines represent the locations of channel surveys performed for input into the hydraulic model used to calculate flood elevations. These locations are also shown on the Flood Profiles in the Flood Insurance Study (FIS) report and can be used to cross reference the Flood Profiles to the planimetric depiction of the flood hazard. All cross sections for which a spatial location is available should be included in this table.

The spatial elements representing cross sections are lines generally extending from outside the floodplain, across the entire floodplain and out the other side. Each cross section should be represented by a single line feature without the hexagons shown on each end on the hardcopy map. The location and shape of the lines should depict as accurately as possible the position of the cross section used.

This is a modified Standard DFIRM Database table that includes Standard DFIRM Database items and Enhanced Database items. All items after SOURCE_CIT are Enhanced. The Enhanced DFIRM Database must contain all modeled cross sections, whether they are printed on the FIRM or not.

The S_XS table contains the following elements.

XS_LN_ID	R	S	Primary key for table lookup. Assigned by table creator.
XS_LTR	A	S	Cross-Section Letter. The letter or number that is assigned to the cross section on the hardcopy FIRM and in the FIS report. This attribute is blank if the cross section is not shown on the FIRM. For a digital conversion, only cross sections that are shown on the FIRM will be available.
START_ID	R	S	Start Identification. This is a link to the station start lookup table. The station start describes the origin for the measurements in the STREAM_STN field. This field should contain a number that links to a unique value in the START_ID field in the L_Stn_Start table.
STREAM_STN	R	S	Stream Station. This is the measurement along the stream to the cross-section location. Normally this information is available in the Floodway Data table in the FIS report. When no Floodway Data table is published, this value can be read from the horizontal scale of the flood profile. The units are clarified in the description in the START_DESC field in the L_Stn_Start table.

XS_LN_TYP	R	S	Cross-Section Line Type. This attribute should contain 'LETTERED' for cross sections that are shown on the hardcopy FIRM. If the cross section will not be shown on the hardcopy FIRM, this attribute should contain 'NOT LETTERED' to indicate that the cross section is part of the backup data for the study, but is not shown on the FIRM.
WTR_NM	R	S	Surface Water Feature Name. This is the formal name of the surface water feature, as it will appear on the hardcopy FIRM.
WSEL_REG	R	S	Regulatory Water-Surface Elevation for the 1-Percent-Annual-Chance Flood Event. This is the precise water surface elevation of the base flood calculated at this cross section. This elevation exactly matches the elevation of the base flood in the Flood Profiles and the Floodway Data table. This number is determined during the engineering analysis for the study. This value should match the regulatory column in the Floodway Data table in the FIS report or the elevation from the corresponding flood profile if no Floodway Data table is published.
LEN_UNIT	R	S	Water Surface Elevation Units. This unit indicates the measurement system used for the water surface elevation. Normally this would be feet. Acceptable values for this field are listed in the D_Length_Units table.
V_DATUM	R	S	Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally this would be North American Vertical Datum of 1988 for new studies. Acceptable values for this field are listed in the D_V_Datum table.
SOURCE_CIT	R	S	Source Citation. Abbreviation used in the metadata file when describing the source information for the S_XS table. Table:
BED_ELEV	R	E	Streambed Elevation. The elevation of the streambed at this cross section as shown on the Flood Profile in the FIS.
TOP_WIDTH	R	E	Top Width. Width of the floodway at this cross section as shown in the Floodway Data table in the FIS.
XS_AREA	R	E	Cross Section Area. Area of the cross section underwater for the width of the floodway as shown in the Floodway Data table in the FIS.
AREA_UNIT	R	E	Area Unit. This unit specifies the areal unit for the area of the cross section underwater for the width of the floodway. Acceptable values for this field are listed in the D_Area_Units table.

VELOCITY	R	E	Mean Velocity. The mean velocity of the floodway at this cross section as shown in the Floodway Data table in the FIS.
VEL_UNIT	R	E	Velocity Measurement. This unit specifies the unit of measurement for the velocity of the floodway. Acceptable values for this field are listed in the D_Velocity_Units table.

Table: S_XS

Field	R/A	S/E	MS Access					ESRI Shapefile			ESRI Coverage				MapInfo		
			type	field size	dec	format	input mask	type	width	dec	type	item width	output width	dec	type	width	dec
XS_LN_ID	R	S	text	11				string	11		character	11	11		character	11	
XS_LTR	A	S	text	12				string	12		character	12	12		character	12	
START_ID	R	S	text	11				string	11		character	11	11		character	11	
STREAM_STN	R	S	text	12				string	12		character	12	12		character	12	
XS_LN_TYP	R	S	text	20				string	20		character	20	20		character	20	
WTR_NM	R	S	text	100				string	100		character	100	100		character	100	
WSEL_REG	R	S	number (double)	8	2			number	13	2	numeric	8	13	2	decimal	15	2
LEN_UNIT	R	S	text	20				string	20		character	20	20		character	20	
V_DATUM	R	S	text	6				string	6		character	6	6		character	6	
SOURCE_CIT	R	S	text	11				string	11		character	11	11		character	11	
BED_ELEV	R	E	number (double)	8	2			number	13	2	numeric	8	13	2	decimal	15	2
TOP_WIDTH	R	E	number	8	2			number	13	2	numeric	8	13	2	decimal	15	2