

Guidelines and Standards: Master Index

This Master Index supports FEMA Risk MAP stakeholders by providing a cross-reference of guidelines and standards documentation available for their flood risk projects, processing of letters of map change and related Risk MAP activities. These guidance documents, standards, templates and other related files are posted in the [FEMA Resource and Document Library](#) (FEMA Library). The cross-referenced relationships are organized and accessible through 4 hyperlinked tables below:

1. [Standards Table](#): provides a list of Standards for Flood Risk Projects and their relationship to FEMA Risk MAP guidance documents.
2. [Guidance Table](#): provides a list of FEMA Risk MAP guidance documents and their relationship to standards. This table also provides a direct link to each document in the FEMA Library.
3. [Technical Reference Table](#): provides a list of Technical Reference documents and a direct link to each document in the FEMA library.
4. [Templates and Other Resources](#): provides a list of Templates and other resources and a direct link to each document in the FEMA library.

Only a portion of the Risk MAP Guidance documents have been transformed into the new format. As a result, many standards do not currently have links to guidance and only a portion of the guidance topics are referenced. If a specific topic is needed and not found in the reference tables, please review the 'Instructions for Using Interim Guidance' on how to access previous *Guidelines and Specifications for Flood Hazard Mapping Partners* documents. This document can be found at: [Finding Standards, Guidance, and Related Documents](#).

The current versions of the standards can be found in the *Guidelines and Standards Policy Memo* which is located in the FEMA library: <http://www.fema.gov/media-library/assets/documents/35313>.

Standards Table:

SID #	Standard	Related Guidance
1	All Flood Risk Projects and LOMCs must be tracked in the MIP.	<ul style="list-style-type: none"> • Discovery
2	A Project Management Team shall be formed as soon as a Flood Risk Project is initiated, and this team shall manage the project for its entire lifecycle.	<ul style="list-style-type: none"> • Discovery
3	When a community is initially considered for a Flood Risk Project involving a new or revised flood hazard analysis, FEMA must establish and maintain a community case file per 44 CFR 66.3.	<ul style="list-style-type: none"> • Discovery
4	All newly initiated Flood Risk Projects must be watershed-based, with the exception of coastal and small-scale Flood Risk Projects related to levee accreditation status.	<ul style="list-style-type: none"> • Discovery
5	No flooding source will receive a lower level of regulatory flood map product than what currently exists on effective maps.	<ul style="list-style-type: none"> • Discovery
6	Results from both flood hazard validation and needs assessment processes must be stored within the national CNMS database.	<ul style="list-style-type: none"> • Discovery
7	Community-specific requests to update the FIRM outside of the NVUE validation process and LOMR process must be documented in the CNMS database as mapping requests for FEMA Regional review and consideration.	<ul style="list-style-type: none"> • Discovery
8	The CNMS database shall be updated for engineering reference information, validation status, and map issues throughout all pertinent phases of the Flood Risk Project.	<ul style="list-style-type: none"> • Discovery
9	The CNMS database shall be the sole authority for reporting flood map update needs.	<ul style="list-style-type: none"> • Discovery
10	For a studied flooding source to go from 'UNVERIFIED' to "VALID" status within the CNMS database, the flooding source must be re-analyzed.	<ul style="list-style-type: none"> • Discovery
11	When the last assessment date of the Modernized or Paper Inventory exceeds 5 years, the Validation Status shall be changed by FEMA HQ or its designee to 'Unknown' and shall require reassessment.	<ul style="list-style-type: none"> • Discovery
12	Each fiscal year, the Regions shall have a plan to evaluate all CNMS flooding sources within a 5-year period.	<ul style="list-style-type: none"> • Discovery
13	NVUE status must be reported by each FEMA Region to FEMA HQ at least quarterly.	<ul style="list-style-type: none"> • Discovery
14	Regional decisions to prioritize, assess, and perform engineering analyses along various flooding sources must be supported by the data contained in CNMS.	<ul style="list-style-type: none"> • Discovery
15	FEMA shall provide technical and programmatic assistance and prepare responses to inquiries received from Mapping Partners, NFIP constituents and other interested project stakeholders.	<ul style="list-style-type: none"> • Discovery

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16	Each flooding source must be evaluated in CNMS at least once within a 5-year period.	<ul style="list-style-type: none"> • Discovery
17	Discovery is a mandatory element of all Flood Risk Projects, and must be conducted on the same scale at which the Flood Risk Project is initiated. All watershed-based Discovery must be initiated at a geographic footprint no larger than the HUC-8 level.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
18	All communities and tribes must be given an opportunity to review and make corrections to any data and information collected during Discovery prior to distribution of final Discovery products.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
19	Flood Risk Project stakeholders must be contacted prior to the Discovery Meeting.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
20	Discovery must engage all communities and stakeholder organizations within the project area and must engage practitioners across relevant disciplines.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
21	The types of data and information obtained during Discovery must demonstrate a holistic picture of flooding issues, flood risk, and flood mitigation priorities, opportunities, efforts and capabilities.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
22	Decisions to perform additional analyses, data development activities, and/or community engagement within the Flood Risk Project area must be supported by the outcomes from Discovery. These decisions shall be communicated to project stakeholders prior to executing those activities.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
23	A pre-meeting Discovery Map and Report that incorporates appropriate background research must be provided to the communities and Tribes prior to the Discovery Meeting and presented at the Discovery Meeting to facilitate discussions.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
24	A post-meeting Discovery Map and Report will be provided to the communities and Tribes after the Discovery Meeting.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
26	A Discovery Report must include a section listing the data and information collected, when they were received, data sources, and an analysis of the data and information. The Post-Meeting Report must include the outcomes and decisions made at the Discovery Meeting.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
27	A Discovery Meeting with project stakeholders is a required activity of Discovery.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery

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29	During Discovery, data must be identified that illustrates potential changes in flood elevation and mapping that may result from the proposed project scope. If available data does not clearly illustrate the likely changes, an analysis is required that estimates the likely changes. This data and any associated analyses must be shared and results must be discussed with stakeholders.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
30	<p>The Flood Risk Project scope of work must be developed in coordination with project stakeholders.</p> <p>The purchased Flood Risk Project scope of work must be shared with project stakeholders.</p>	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
31	Discovery must include a discussion with stakeholders regarding risk identification, mitigation capabilities and actions, planning, and risk communication.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
33	For coastal Flood Risk Projects that will begin with a storm surge analysis, stakeholder coordination must occur by the end of the storm surge study effort and continue throughout the remainder of the coastal Flood Risk Project.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
34	When storm surge analyses are included in a Flood Risk Project, Discovery efforts must include a discussion of how storm surge estimates have changed since the effective Flood Risk Project.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
35	The FEMA Regional Office must be consulted as to how Tribal Nations should be included in the overall Discovery efforts.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
36	A CNMS database that is compliant with the CNMS Technical Reference must be updated and submitted at the completion of Discovery or Project Initiation, at Preliminary, and at Revised Preliminary if applicable, based on the information and data collected.	<ul style="list-style-type: none"> • Discovery
40	New elevation data purchased by FEMA must comply with the current USGS National Geospatial Program Base LiDAR Specification Version 1.0, except where specifically noted in other FEMA standards.	
41	For areas within the Continental United States field surveys and aerial data acquisition must be referenced to the North American Vertical Datum of 1988 (NAVD88) and the North American Datum 1983 (NAD83) and connected to the NSRS.	<ul style="list-style-type: none"> • Base Map
42	All ground and structure surveys must be certified by a registered professional engineer or a licensed land surveyor.	

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43	<p>Existing topographic data leveraged by FEMA must have documentation that it meets the following vertical accuracy requirements:</p> <p style="text-align: center;">Vertical Accuracy Requirements based on Flood Risk and Terrain Slope within the Floodplain being Mapped</p> <table border="1" data-bbox="239 233 1545 886"> <thead> <tr> <th data-bbox="239 233 575 347">Level of Flood Risk</th> <th data-bbox="575 233 779 347">Typical Slopes</th> <th data-bbox="779 233 984 347">Specification Level</th> <th data-bbox="984 233 1318 347">Vertical Accuracy: 95% Confidence Level FVA/CVA</th> <th data-bbox="1318 233 1545 347">LIDAR Nominal Pulse Spacing (NPS)</th> </tr> </thead> <tbody> <tr> <td data-bbox="239 347 575 423">High (Deciles 1,2,3)</td> <td data-bbox="575 347 779 423">Flattest</td> <td data-bbox="779 347 984 423">Highest</td> <td data-bbox="984 347 1318 423">24.5 cm / 36.3 cm</td> <td data-bbox="1318 347 1545 423">≤ 2 meters</td> </tr> <tr> <td data-bbox="239 423 575 500">High (Deciles 1,2,3)</td> <td data-bbox="575 423 779 500">Rolling or Hilly</td> <td data-bbox="779 423 984 500">High</td> <td data-bbox="984 423 1318 500">49.0 cm / 72.6 cm</td> <td data-bbox="1318 423 1545 500">≤ 2 meters</td> </tr> <tr> <td data-bbox="239 500 575 576">High (Deciles 2,3,4,5)</td> <td data-bbox="575 500 779 576">Hilly</td> <td data-bbox="779 500 984 576">Medium</td> <td data-bbox="984 500 1318 576">98.0 cm / 145 cm</td> <td data-bbox="1318 500 1545 576">≤ 3.5 meters</td> </tr> <tr> <td data-bbox="239 576 575 652">Medium (Deciles 3,4,5,6,7)</td> <td data-bbox="575 576 779 652">Flattest</td> <td data-bbox="779 576 984 652">High</td> <td data-bbox="984 576 1318 652">49.0 cm / 72.6 cm</td> <td data-bbox="1318 576 1545 652">≤ 2 meters</td> </tr> <tr> <td data-bbox="239 652 575 729">Medium (Deciles 3,4,5,6,7)</td> <td data-bbox="575 652 779 729">Rolling</td> <td data-bbox="779 652 984 729">Medium</td> <td data-bbox="984 652 1318 729">98.0 cm / 145 cm</td> <td data-bbox="1318 652 1545 729">≤ 3.5 meters</td> </tr> <tr> <td data-bbox="239 729 575 805">Medium (Deciles 3,4,5,6,7)</td> <td data-bbox="575 729 779 805">Hilly</td> <td data-bbox="779 729 984 805">Low</td> <td data-bbox="984 729 1318 805">147 cm / 218 cm</td> <td data-bbox="1318 729 1545 805">≤ 5 meters</td> </tr> <tr> <td data-bbox="239 805 575 886">Low (Deciles 7,8,9,10)</td> <td data-bbox="575 805 779 886">All</td> <td data-bbox="779 805 984 886">Low</td> <td data-bbox="984 805 1318 886">147 cm / 218 cm</td> <td data-bbox="1318 805 1545 886">≤ 5 meters</td> </tr> </tbody> </table>	Level of Flood Risk	Typical Slopes	Specification Level	Vertical Accuracy: 95% Confidence Level FVA/CVA	LIDAR Nominal Pulse Spacing (NPS)	High (Deciles 1,2,3)	Flattest	Highest	24.5 cm / 36.3 cm	≤ 2 meters	High (Deciles 1,2,3)	Rolling or Hilly	High	49.0 cm / 72.6 cm	≤ 2 meters	High (Deciles 2,3,4,5)	Hilly	Medium	98.0 cm / 145 cm	≤ 3.5 meters	Medium (Deciles 3,4,5,6,7)	Flattest	High	49.0 cm / 72.6 cm	≤ 2 meters	Medium (Deciles 3,4,5,6,7)	Rolling	Medium	98.0 cm / 145 cm	≤ 3.5 meters	Medium (Deciles 3,4,5,6,7)	Hilly	Low	147 cm / 218 cm	≤ 5 meters	Low (Deciles 7,8,9,10)	All	Low	147 cm / 218 cm	≤ 5 meters	
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44	FEMA requires all elevation data to be processed to the bare earth terrain in the vicinity of floodplains that will require hydraulic modeling.																																									
45	FEMA does not require the elevation data to be hydro-flattened, as specified in USGS Lidar Specification.																																									
46	When bare earth post-processing is included in the project the SVA for up to three significant land cover categories shall be tested in addition to the open/bare ground areas already tested for FVA. Up to three land cover categories making up 10% or more of the project area should be included in the SVA testing.																																									
47	Terrain processing areas greater than 2,000 square miles must be divided into smaller blocks of 2,000 square miles or less and tested as individual areas.																																									
48	Checkpoints used for testing SVA of the bare earth elevation product must be located in the areas where bare earth post-processing was performed, distributed to avoid clustering, and support vertical accuracy reporting that is representative of the post processed areas.																																									

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49	All FEMA funded aerial mapping must be certified by a licensed professional or certified photogrammetrist.	
50	The digital terrain model input for a two-dimensional model must cover the entire 2D study area and the derivation or development of the grid must be clearly documented.	
54	Where flood elevations are produced from a hydraulic model, they can be published as BFEs unless the responsible engineer documents why they should not be issued.	
56	Written approval from the FEMA Regional Risk Analysis Branch Chief regarding the alluvial fan methodology must be obtained before the commencement of full analysis. To inform this decision, sufficient field data and analysis and records of community engagement relative to the scope and methodology must be provided.	<ul style="list-style-type: none"> • Stakeholder Engagement: Discovery
57	The regulatory and non-regulatory flood risk products must be based on H&H or coastal analyses using existing ground conditions in the watershed and floodplain. The multiple profile and floodway runs must have the same physical characteristics in common for existing ground conditions. However, a community may choose to include flood hazard information that is based on future conditions on a FIRM (shown as shaded Zone X); in an FIS Report; or non-regulatory products in addition to the existing-conditions.	<ul style="list-style-type: none"> • Stakeholder Engagement: Discovery
59	Hydrologic and hydraulic analyses must be calibrated using data from well-documented flood events, if available.	
61	Engineering analyses must be documented and easily reproducible and must include study methods, reasoning for method selection, input data and parameters, sources of data results, and justifications for major changes in computed flood hazard parameters.	<ul style="list-style-type: none"> • Coastal Study Documentation and Intermediate Data Submittals
62	New or updated flood hazard data used for the regulatory products must be supported by modeling or sound engineering judgment and all regulatory products must be in agreement.	
65	BFEs must agree with those of other contiguous studies of the same flooding source within 0.5 foot, unless it is demonstrated that it would not be appropriate. Please see 44 CFR 65.6a(2).	
66	Each modeled split or diverted flow path must be plotted with individual Flood Profiles.	
67	Grids or cells must not be artificially removed when two- or three-dimensional models are used.	
69	Floodway surcharge values must be between zero and 1.0 ft. If the State (or other jurisdiction) has established more stringent regulations, these regulations take precedence over the NFIP regulatory standard. Further reduction of maximum allowable surcharge limits can be used if required or requested and approved by the communities impacted.	

SID #	Standard	Related Guidance
70	If a stream forms the boundary between two or more States and/or tribes, either the 1.0-foot maximum allowable rise criterion or existing floodway agreements between the parties shall be used.	
71	Revised floodway data must match any effective floodways at the limits of the Flood Risk Project.	
72	An equal conveyance reduction method must be used to establish the minimal regulatory floodway.	
73	To calculate floodways using methodologies other than steady-state, one-dimensional models, pre-approval must be received from the FEMA Project Officer and impacted communities and states with floodway authorities.	
74	The hydrologic, hydraulic, and coastal analyses and the final regulatory products must be certified by a registered professional engineer.	
75	<p>For each stream with cross sections where a floodway was determined under the scope of work, a Floodway Data Table compliant with the FIS Report Technical Reference must be prepared as part of the hydraulic analysis. The Floodway Data Table must contain an entry for each lettered, mapped cross section that includes the following information:</p> <ul style="list-style-type: none"> • Cross-section identification shown in a georeferenced spatial file; • Stream or profile baseline station of the cross section; • Width of the floodway at the cross section; • Wetted area of the cross section under encroached conditions; • Average velocity of the floodwaters at the cross section under encroached conditions; • The greater of BFEs from all flooding sources, including from backwater, affecting the cross section (regulatory elevation); • The BFE from the existing conditions model (without-floodway elevation); • The BFE from the encroached existing conditions model (with-floodway elevation); and • Difference between with- and without-floodway elevations (surcharge). 	
76	If previously-modeled storage areas are removed or filled, the models must be updated to reflect the loss in storage.	
77	Floodway computations for tributaries must be developed without consideration of backwater from confluences.	
78	The water-surface profiles of different flood frequencies must not cross one another.	
79	Water-surface elevations shown on the Flood Profiles shall not rise from an upstream to downstream direction.	

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80	If a flow path other than the stream centerline is more representative of the direction of flow, the case must be documented and the flow path shown and labeled on the FIRM as the "Profile Baseline". Flow distances in one-dimensional models must be referenced to the profile baseline.	<ul style="list-style-type: none"> • FIRM Graphics
81	Ineffective and non-conveyance areas must be designated to reflect the actual conditions (such as topography and surface roughness) as closely as practical.	
82	Final invoices shall not be paid until a TSDN is submitted, and certification is provided that contract or grant requirements are met.	
83	The FEMA Regional staff initiating a Flood Risk Project shall first engage all stakeholders in order to fully understand the impacted communities, leverage other FEMA activities in the area, and thereby avoid duplication of benefits through funding to CTPs.	
84	<p>All riverine engineering Flood Risk Projects shall consist of a hydraulic model with multiple frequencies: 0.2 percent, 1-percent, 2-percent, 4-percent, and 10-percent-annual-chance exceedance events.</p> <p>In addition, the "1-percent plus" flood elevation shall be modeled for all riverine analyses. The 1% plus flood elevation is defined as a flood elevation derived by using discharges that include the average predictive error for the regression equation discharge calculation for the Flood Risk Project. This error is then added to the 1% annual chance discharge to calculate the new 1% plus discharge. The upper 84-percent confidence limit is calculated for Gage and rainfall-runoff models for the 1% annual chance event.</p> <p>The "1-percent plus" flood elevation must be shown on the Flood Profile in the FIS Report to best understand and communicate the uncertainty of the flood elevation.</p> <p>The mapping of the "1-percent plus" floodplain is optional and will only be produced when it is determined to be appropriate.</p>	
85	Deviations from standards must be approved by FEMA, tracked for exception reporting, and documented.	<ul style="list-style-type: none"> • Coastal Study Documentation and Intermediate Data Submittals
86	For coastal Flood Risk Projects, wave runup analyses shall compute the wave runup elevation as the value exceeded by 2 percent of the runup events.	
87	For coastal Flood Risk Projects, intermediate data submissions to FEMA are required at key milestones during the coastal analysis process.	<ul style="list-style-type: none"> • Coastal Study Documentation and Intermediate Data Submittals • Coastal Data Capture

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88	All coastal processes and flooding sources that contribute to the 1-percent-annual-chance flood condition both at a regional and local scale must be considered.	<ul style="list-style-type: none"> • General Coastal Considerations
89	For coastal Flood Risk Projects, non-levee coastal structures must be evaluated and the profile adjusted as necessary to reflect expected storm impacts on the structure for the purpose of establishing appropriate risk zone determinations for NFIP maps.	<ul style="list-style-type: none"> • General Coastal Considerations
90	Methods and models used to evaluate the flood hazard must be technically reliable, must be appropriate for flood conditions and produce reasonable results. All computer models must adhere to 44 CFR 65.6 a(6).	<ul style="list-style-type: none"> • General Coastal Considerations
91	<p>For Pacific coastal Flood Risk Projects, VE Zones are identified using one or more of the following criteria for the 1% flood conditions:</p> <ol style="list-style-type: none"> 1. The wave runup zone occurs where the (eroded) ground profile is 3.0 feet or more below the TWL. 2. The wave overtopping splash zone is the area landward of the crest of an overtopped barrier, in cases where the potential wave runup exceeds the barrier crest elevation by 3.0 feet or more. 3. The high-velocity flow zone is landward of the overtopping splash zone (or area on a sloping beach or other shore type), where the product of depth of flow times the flood velocity squared is greater than or equal to 200 ft³/sec². 4. The breaking wave height zone occurs where 3-foot or greater wave heights could occur (this is the area where the wave crest profile is 2.1 feet or more above the static water elevation). 5. The primary frontal dune zone, as defined in 44 CFR 59.1 of the NFIP regulations. 	
92	For coastal Flood Risk Projects, regional surge and wave model performance shall be successfully validated for the Flood Risk Project area.	
93	Flood Risk Projects shall use the best available, quality-assured data that meets the needs of the study methodology.	<ul style="list-style-type: none"> • General Coastal Considerations
96	Coastal analyses shall not account for future impacts due to long term erosion. Episodic, storm-induced erosion must be included in the flood hazard analysis.	<ul style="list-style-type: none"> • General Coastal Considerations

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98	<p>For Atlantic and Gulf of Mexico Flood Risk Projects, VE zones shall be mapped when one or more of the following criteria for the base flood conditions exist:</p> <ul style="list-style-type: none"> • The wave runup zone occurs where the (eroded) ground profile is 3.0 feet or more below the 2-percent wave runup elevation; • The wave overtopping splash zone is the area landward of the crest of an overtopped barrier, in cases where the overtopping rate exceeds 1 cfs/ft; • The breaking wave height zone occurs where 3-foot or greater wave heights could occur; • The primary frontal dune zone, as defined in 44 CFR 59.1 of the NFIP regulations under <i>Coastal High Hazard Area and Primary Frontal Dune</i>. 	
99	<p>Areas of shallow flooding shall not have modeled/computed floodways due to the inherent uncertainties associated with their flow patterns. However, communities can choose to have administrative floodways for such areas.</p>	
100	<p>Ponding areas with depths between 1 and 3 feet shall be designated and delineated as Zone AH.</p>	
101	<p>Sheet runoff areas shall be delineated as Zone AO with average flooding depths above the ground surface, rounded to the nearest whole foot, indicated on the work map or digital GIS data.</p>	
103	<p>For areas where new regulatory maps are being issued, flood hazard information on the effective NFIP map (i.e., FIRM, FBFM, FHBM) that is not being updated through a separate flood hazard analysis or floodplain boundary redelineation shall be “carried over” to the new or updated FIRM.</p>	
104	<p>Redelineation shall only be used when the terrain source data is better than effective and the stream reach is classified as VALID in the CNMS database.</p>	
105	<p>BFE placement standard exceptions may be made where BFEs are expressed in metric increments, such as in Puerto Rico.</p>	<ul style="list-style-type: none"> • FIRM Graphics
106	<p>BFEs for ponding and lacustrine areas must be expressed to the 10th of a foot if they have been calculated to that level of precision; otherwise they should be shown as whole-foot rounded elevations. Unrevised lake and ponding elevations may be converted to 10th foot elevations if supported by technical data on a project-by project basis in coordination with the FEMA Project Officer. BFEs for coastal flood zones must be shown as whole foot elevations.</p>	<ul style="list-style-type: none"> • FIRM Graphics
107	<p>BFEs must be shown within 1% annual chance floodplains; the exception shall be for Zone A, Zone V, Zone AO and Zone A99.</p>	<ul style="list-style-type: none"> • FIRM Graphics
108	<p>Regulatory floodways must be mapped within the 1-percent-annual-chance floodplain and must meet the minimum standards outlined in Paragraph 60.3(d)(3) of the NFIP regulations.</p>	<ul style="list-style-type: none"> • FIRM Graphics

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109	Stream channel boundaries or centerlines must be shown within the identified 1-percent-annual-chance floodplain; if a regulatory floodway is developed, the stream must be shown within the regulatory floodway boundaries.	<ul style="list-style-type: none"> • FIRM Graphics 																										
110	Flooding sources with contributing drainage area less than 1 square mile and/or with an average flood depth of less than one foot shall not be included in the Flood Risk Project scope of work, unless they have been analyzed on the effective FIRM or a justified need is identified during Discovery.																											
111	At the conclusion of a flood risk project, all SFHA designations—existing, revised, and new—in the project area must be supported by documentation or agreed to by the community.	<ul style="list-style-type: none"> • Coastal Study Documentation and Intermediate Data Submittals 																										
112	For all Flood Risk Projects contracted in 2006 and beyond, all floodplain boundaries for new or revised flooding sources within the PMR footprint shall pass the Floodplain Boundary Standard.																											
113	<p>The flood risk class must be determined for each flooding source to identify what Floodplain Boundary Standard must be met and what level of analysis is required.</p> <table border="1" data-bbox="247 711 1497 1268"> <thead> <tr> <th rowspan="2">Risk Class</th> <th rowspan="2">Characteristics</th> <th colspan="2">Delineation Reliability of the floodplain boundary per study methodology¹</th> </tr> <tr> <th>Zone A</th> <th>All Other Zones</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>High population and densities within the floodplain and/or high anticipated growth</td> <td>+/- 1/2 contour 95%</td> <td>+/- 1.0 foot / 95%</td> </tr> <tr> <td>B</td> <td>Medium population and densities within the floodplain and/or modest anticipated growth</td> <td>+/- 1/2 contour 90%</td> <td>+/- 1.0 foot / 90%</td> </tr> <tr> <td>C</td> <td>Low population and densities within the floodplain, small or no anticipated growth</td> <td>+/- 1/2 contour 85%</td> <td>+/- 1.0 foot / 85%</td> </tr> <tr> <td>D</td> <td>Undetermined Risk, likely subject to flooding</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>E</td> <td>Minimal risk of flooding; area not studied</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table> <p>¹The difference between the ground elevation (defined from topographic data) and the computed flood elevation</p>	Risk Class	Characteristics	Delineation Reliability of the floodplain boundary per study methodology ¹		Zone A	All Other Zones	A	High population and densities within the floodplain and/or high anticipated growth	+/- 1/2 contour 95%	+/- 1.0 foot / 95%	B	Medium population and densities within the floodplain and/or modest anticipated growth	+/- 1/2 contour 90%	+/- 1.0 foot / 90%	C	Low population and densities within the floodplain, small or no anticipated growth	+/- 1/2 contour 85%	+/- 1.0 foot / 85%	D	Undetermined Risk, likely subject to flooding	N/A	N/A	E	Minimal risk of flooding; area not studied	N/A	N/A	
Risk Class	Characteristics			Delineation Reliability of the floodplain boundary per study methodology ¹																								
		Zone A	All Other Zones																									
A	High population and densities within the floodplain and/or high anticipated growth	+/- 1/2 contour 95%	+/- 1.0 foot / 95%																									
B	Medium population and densities within the floodplain and/or modest anticipated growth	+/- 1/2 contour 90%	+/- 1.0 foot / 90%																									
C	Low population and densities within the floodplain, small or no anticipated growth	+/- 1/2 contour 85%	+/- 1.0 foot / 85%																									
D	Undetermined Risk, likely subject to flooding	N/A	N/A																									
E	Minimal risk of flooding; area not studied	N/A	N/A																									
114	A horizontal tolerance of +/- 38 feet will be used to determine the compliance with the vertical tolerances defined for each risk class. This horizontal tolerance will address varying floodplain delineation techniques (automated versus non-automated) and map scale limitations.																											

SID #	Standard	Related Guidance
115	For the FBS audit, the terrain data source that was used to create the flood hazard boundary must be used to conduct the audit.	
118	For areas within the continental United States, all new flood maps and updates must be referenced to NAVD88.	<ul style="list-style-type: none"> • Vertical Datum
119	If the final average countywide or flooding source-based datum conversion value is less than +/- 0.1 foot, the datum conversion shall be considered to be executed and the flood elevations for those flooding sources on the FIRM, Flood Profiles, and in the FIS Report tables shall not be adjusted.	<ul style="list-style-type: none"> • Vertical Datum
120	The published flood elevations for all flooding sources within a community must be referenced to a single vertical datum.	<ul style="list-style-type: none"> • Vertical Datum
121	The vertical datum conversion factors shall be applied to flood elevations reported on the FIRM, Flood Profiles shown in the FIS Report, and all data tables in the FIS Report that report flood elevations. All unrevised hydraulic models and supporting backup information shall also be clearly labeled in the Technical Support Data Notebook (TSDN) to indicate that the FIRM and FIS Report reflect a datum conversion, and document the process used to determine the applied conversion factor.	<ul style="list-style-type: none"> • Vertical Datum
122	Either a single countywide vertical datum conversion factor or an average flooding source-based conversion factor must be used for a grouping of flooding sources, for individual flooding sources, or for flooding source segments.	<ul style="list-style-type: none"> • Vertical Datum
123	A single countywide vertical datum conversion factor shall be applied when the maximum offset from the average conversion factor does not exceed 0.25 foot.	<ul style="list-style-type: none"> • Vertical Datum
124	When calculating a single countywide vertical datum conversion, USGS topographic Quadrangle corners falling within the land area of the county must be used to calculate the vertical datum conversion factor.	<ul style="list-style-type: none"> • Vertical Datum
125	<p>When a single countywide conversion is not possible, an average vertical datum conversion factor shall be calculated using a flooding source-based method for a grouping of flooding sources, an individual flooding source, or segments of a flooding source.</p> <p>When a flooding source-based conversion is executed, 3 evenly distributed points along each flooding source (or segment of a flooding source) shall be selected to be included the datum conversion calculation.</p> <p>The maximum offset from the average conversion factor determined for the flooding source, grouping of flooding sources or flooding source segment may not exceed 0.25 foot.</p>	<ul style="list-style-type: none"> • Vertical Datum
126	All flood elevations must be tied in when performing datum conversions.	<ul style="list-style-type: none"> • Vertical Datum

SID #	Standard	Related Guidance
127	The datum conversion factors (countywide or stream-based) must be clearly documented in the FIS Report tables.	
128	For floodplains mapped from 2-D models, separate Flood Profiles for significant flow paths must be created.	
131	All non-conveyance areas considered in the model must be mapped.	
132	The regulatory floodway must be terminated at the boundary of the VE or V Zone, or where the mean high tide exceeds the 1-percent-annual-chance riverine flood elevation, whichever occurs further upstream.	
133	Floodplain boundaries of the 1-percent-annual-chance flood must be delineated. If it is calculated, the 0.2-percent-annual-chance flood must be delineated.	<ul style="list-style-type: none"> • FIRM Graphics
134	If the re-delineation topographic data indicates that the effective hydraulic analyses are no longer valid, further actions must be coordinated with the FEMA Project Officer and the CNMS database must be updated.	
136	RFHL to NFHL submissions must pass NFHL QC checks at submission and study data must be submitted before the study effective date.	<ul style="list-style-type: none"> • National Flood Hazard Layer (NFHL)
137	Redelineation of coastal flood hazard areas requires the revision of the 1-percent-annual-chance SFHA boundary, the 0.2%-annual-chance floodplain boundary, and the primary frontal dune delineation.	
138	Coastal Flood Risk Projects shall produce, at a minimum, a 1%-annual-chance and 0.2%-annual-chance floodplain and base flood elevations that include the contribution of wave effects.	<ul style="list-style-type: none"> • General Coastal Considerations
139	For coastal Flood Risk Projects, where topographic data reflects recent beach nourishment projects, and beach berms or dunes do not reflect equilibrium conditions or have long-standing vegetative cover as per 44 CFR 65.11, the data shall be adjusted to reflect equilibrium conditions prior to conducting the storm-induced erosion and onshore wave hazard analyses.	<ul style="list-style-type: none"> • General Coastal Considerations
140	Shallow flooding areas shall not contain non-SFHA islands based on small scale topographic variations.	
141	In regions of the United States where ice jams are typical, the project shall include investigation of historical floods for evidence of ice-jam contribution and coordination of the methodology with the impacted communities and State as part of the Discovery process.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery
142	Where ice jams occur, backwater effects must be taken into account.	
143	The appropriate methodology for the floodway designation in areas mapped with an ice-jam analysis shall be determined in coordination with the community.	<ul style="list-style-type: none"> • Stakeholder Engagement: Discovery

SID #	Standard	Related Guidance
145	A transect location map must be provided in the FIS Report narrative if transects are not shown on the FIRM.	
146	FEMA must be notified of any potential floodplain management violations identified through the submittal of new or revised flood hazard data. Pending mapping changes affected by the potential violation will be suspended until the issue is resolved.	<ul style="list-style-type: none"> • Stakeholder Engagement: Discovery
147	The minimum resolution requirement for raster data files (ortho-imagery) is 1-meter ground distance.	<ul style="list-style-type: none"> • Base Map
148	The minimum horizontal positional accuracy for new FIRM base map hydrographic and transportation features is the NSSDA radial accuracy of 38 feet.	<ul style="list-style-type: none"> • Base Map
149	The base map used for the Flood Insurance Rate Map must clearly show sufficient current ground features to enable clear interpretation of the flood hazard data displayed on the base map.	<ul style="list-style-type: none"> • Base Map • FIRM Graphics
150	The FIRM paneling scheme shall follow that used by the USGS for the 7.5-minute-series quadrangle, or subdivisions thereof.	<ul style="list-style-type: none"> • Base Map • FIRM Index
151	All digital FIRMs must be oriented so that grid north points to the top of the map sheet.	<ul style="list-style-type: none"> • FIRM Graphics • FIRM Index
152	Geospatial data for use in Flood Risk Projects must be coordinated, collected, documented and reported with standardized, complete and current information in compliance with Federal geospatial data reporting standards.	<ul style="list-style-type: none"> • Metadata
153	Details of cost, leverage, and project scope must be reported to FEMA's geospatial data tracking systems.	
154	All unnecessary duplication of Federal, State or local mapping efforts must be avoided.	<ul style="list-style-type: none"> • Stakeholder Engagement: Discovery
155	State Geospatial Data Coordination Procedures and Points of Contact must be reported to FEMA as new sources of Federal or State data are identified.	
157	FEMA will not provide funding for new base map data collection as part of a specific Flood Risk Project.	<ul style="list-style-type: none"> • Base Map
158	Elevation data created using FEMA funding must allow unlimited free distribution by FEMA and partners.	
161	All deliverables and supporting data must be uploaded to the MIP as each workflow step is completed for each project task. If any of these data are modified subsequently, the revised data must be uploaded to the MIP before the effective date of the FIRMs or the completion of the project, if no regulatory products are produced.	<ul style="list-style-type: none"> • Coastal Data Capture

SID #	Standard	Related Guidance
163	The Preliminary digital FIRM Database shall be distributed for review with the Preliminary FIRM and FIS Report.	
164	The FEMA Regional office must approve distribution of preliminary and revised preliminary products.	
165	Preliminary/Revised Preliminary copies of the FIRM, FIS Report, SOMAs (if modified during Revised Preliminary), and Letters shall be distributed to the community CEO and floodplain administrator; State NFIP Coordinator; and other identified stakeholders as appropriate.	
166	Following issuance of the Preliminary copies of the FIRM and FIS Report, FEMA shall provide a period (usually 30 days) for community officials, community residents, and other interested parties / stakeholders to review the Preliminary copies of the FIRM and FIS Report.	
168	All effective LOMCs located on affected FIRM panel(s) shall be reviewed and categorized: 1. through a draft SOMA before the Preliminary copies of the affected FIRM panel(s) are prepared and sent to the community for review and comment; 2. through a revised draft SOMA before Revised Preliminary copies of the affected FIRM panel(s) are prepared and sent to the community for review and comment; 3. through a Final SOMA before the LFD letter is sent to the community; and 4. through a revalidation letter before the effective date of the new or revised FIRM panels.	
169	All LOMRs issued during post-preliminary prior to the LOMC cutoff date (which is 60 days before the project's LFD date) must be incorporated into the new FIS Report and FIRM. LOMRs that are issued after this time must be re-issued after the revised FIRM date.	
170	CBRS units shown on all new and revised FIRMs must be provided by the U.S. Fish and Wildlife Service.	<ul style="list-style-type: none"> • Coastal Barrier Resources System
172	All Preliminary Title Blocks shall be stamped "Preliminary" or "Revised Preliminary" as appropriate.	<ul style="list-style-type: none"> • FIRM Index
173	No effective date or map revised date shall be shown on the preliminary or revised preliminary title blocks.	<ul style="list-style-type: none"> • FIRM Index
174	Certification of completeness of all submitted data for FEMA-funded Flood Risk Projects must be provided when work on a project is complete (via the certification forms provided in http://www.fema.gov/library/viewRecord.do?id=7577)	<ul style="list-style-type: none"> • Coastal Data Capture
175	The preliminary FIS Report must be submitted with the other required submittals at the completion of the Floodplain Mapping task.	
176	All spatial data must be georeferenced, have a standard coordinate system and projection defined and documented, and specify the horizontal and vertical datums used.	<ul style="list-style-type: none"> • Coastal Data Capture

SID #	Standard	Related Guidance
178	<p>For each data development task prior to Develop [D]FIRM Database, the data for flooding sources receiving new or revised flood hazard analyses must be submitted in accordance with the FIRM Database Submittal Table, and following the schema of the FIRM Database Technical Reference. Non-FEMA funded external data studies are excluded from this requirement.</p> <p>Data submittals for all new, revised, and existing analyses must include the S_Submittal_Info table compliant with the schema in the FIRM Database Technical Reference.</p>	<ul style="list-style-type: none"> • Coastal Data Capture
180	<p>All regulatory and non-regulatory deliverables and relevant supporting data must be submitted in one of the acceptable file format(s) and in the directory structure outlined in the Data Capture Technical Reference.</p> <p>If data are collected that are not specifically mentioned in the Data Capture Technical Reference but are relevant to the project, or data is obtained from existing flood hazard analyses, those data must be submitted, but do not have to follow the file format and directory structure requirements.</p>	<ul style="list-style-type: none"> • Coastal Data Capture
181	<p>A metadata file in XML format must be submitted that complies with the Metadata Profiles Technical Reference for each applicable task for regulatory and non-regulatory deliverables or relevant supporting data submittals.</p>	<ul style="list-style-type: none"> • Coastal Data Capture • Metadata
182	<p>Copies of all project-related data must be retained for a period of three years.</p>	<ul style="list-style-type: none"> • Coastal Data Capture
183	<p>A file that compiles general correspondence must be submitted for each project task.</p>	<ul style="list-style-type: none"> • Coastal Data Capture
184	<p>Any supporting data that are tiled must have an accompanying index spatial file. Tiles must be topologically correct and have only one part, and cannot self-intersect (must be simple). Adjacent tiles must not overlap or have gaps between them.</p>	<ul style="list-style-type: none"> • Coastal Data Capture
185	<p>PDF files must be created using the source file (e.g., MS Word file). Created PDF files must allow text to be copied and pasted to another document.</p>	<ul style="list-style-type: none"> • Coastal Data Capture
186	<p>A narrative must be submitted that summarizes the work performed (streams analyzed, type of Flood Risk Project, etc.), direction from FEMA, assumptions and issues, and any information that may be useful for the other mapping partners working on the project or subsequent users of the Flood Risk Project backup data for each task.</p>	<ul style="list-style-type: none"> • Coastal Data Capture

SID #	Standard	Related Guidance
187	All relevant data must be submitted that fully documents the flood risk project including the engineering analyses, input and output files for the models used; a report that documents the methodology, assumptions, and data used in the engineering analyses; applicable draft FIS Report text sections, tables, graphics, Flood Profiles; quality records in the form of (at a minimum) QR3 Self-Certification Forms, and QR3, QR5, QR7, & QR8 Checklists; input and output files associated with the flood risk assessments; the Flood Risk Report; the Flood Risk Map; the MXD(s) for the Flood Risk Map; and any other backup data. These data comprise the TSDN.	<ul style="list-style-type: none"> • Coastal Data Capture • Coastal Study Documentation and Intermediate Data Submittals • Quality Management
188	FEMA must be able to distribute the base map data and floodplain information freely to the public in hardcopy and digital formats.	<ul style="list-style-type: none"> • Base Map • Stakeholder Engagement: Discovery
189	Effective and revised flood hazard data must be tied in with no discontinuities. Where discontinuities cannot be resolved, they must be documented in the CNMS database, but not until the discontinuity is accepted by the FEMA Project Officer.	
190	All technical review comments associated with the FIS Report, FIRM, or FIRM database must be fully addressed and resolutions must be fully documented.	<ul style="list-style-type: none"> • Quality Review
191	All standard correspondence, letters, and enclosures distributed during the life of a Flood Risk Project must be prepared in accordance with the templates located at http://www.fema.gov/library/viewRecord.do?id=7577 .	
192	Unique FEMA Case Numbers (e.g., 01-05-1234R) shall be assigned for all initiated LOMCs and Flood Risk Projects.	
193	The Flood Hazard Determinations-on-the-Web tool is the authoritative source for creating and publishing Flood Hazard Determination Notices for Flood Risk Projects and LOMRs that result in new or modified flood hazard information.	
195	LOMC requestors shall submit requests, including the required review and processing fee if applicable, to the appropriate processing address. The address is provided in the application forms package that must be used in preparing a LOMC request for submittal.	
196	If required by state law, State concurrence with the LOMR or CLOMR shall be required.	
197	<p>Upon receipt of a LOMC, the following shall be done:</p> <ul style="list-style-type: none"> • Make an initial determination as to the expected processing procedure • Assign a case number • Create a case file • Enter the request into the MIP • Record the date of receipt 	

SID #	Standard	Related Guidance
198	When processing a LOMC, any ongoing, past, or future map actions affecting the case shall be taken into consideration.	
199	LOMC submittals must include certifications by a licensed professional authorized to certify the data under state law.	
200	A LOMR or CLOMR must be supported by a topographic map or digital data that includes all relevant information required by FEMA.	
201	A LOMR or CLOMR must include proposed floodplain and/or floodway boundary delineations shown on an annotated FIRM.	
202	All LOMRs including new grading or structures must include certified as-built construction plans, grading plans, or survey data.	
203	If the discharges in the effective FIS Report are not used in the LOMR or CLOMR submittal, the revision requester shall provide sufficient data to support the use of the new discharges for the 1-percent-annual-chance flood and other published flood frequencies.	
204	A LOMR or CLOMR in riverine areas must submit a model duplicating the effective hydraulic model (multiple profile and floodway if appropriate). The revision requester shall use it to establish the baseline condition unless an existing conditions hydraulic model is required.	
205	For a LOMR or CLOMR, an existing conditions hydraulic model is required if the duplicate effective model does not reflect the floodplain conditions prior to the start of the project.	
206	If the revision is submitted as the result of a project, a post-project revised hydraulic model reflecting as-built conditions must be submitted.	
207	At a minimum, the analyses and other supporting data provided in support of a revision request must be equivalent to or better than the scientific and technical data employed by FEMA for the preparation of the effective analyses.	
210	For floodplain boundary revisions based on new or more detailed topographic information, the revision requester will not be required to submit revised hydraulic analyses unless the changes in ground contours have significantly affected the geometry of cross sections used for the effective FIS Report and FIRM or have altered effective-flow areas.	
213	During the Notice-to User revision process, approval of the action taken shall be obtained from the FEMA HQ due process lead and the decision must be documented in writing.	<ul style="list-style-type: none"> <li data-bbox="1606 1369 1806 1401">• Notice-to-User

SID #	Standard	Related Guidance
214	<p>During the Notice-to User revision process:</p> <ul style="list-style-type: none"> the FIRM database must be corrected as appropriate the FIS Report, FIRM, and/or FBFM must be corrected and indicate on the document the reprinted date; the corrected components must be distributed to all entities that received the defective product; and the corrected components must be updated on the MSC site. 	<ul style="list-style-type: none"> Notice-to-User
215	<p>Conditional LOMCs are subject to the same standards of a LOMA, LOMR-F, or LOMR except:</p> <ul style="list-style-type: none"> Because Conditional LOMCs are based on proposed construction, as-built information is not required. The Conditional Comment Documents that are issued by FEMA do not amend the effective FHBM or FIRM. Conditional LOMRs and CLOMR-Fs must demonstrate compliance with the Endangered Species Act. 	
216	<p>A letter shall be mailed to the requester acknowledging receipt of the LOMC request within business three days of receiving the data.</p>	
217	<p>If all information is not received within 90-days from the date of the request for additional data, the processing of the LOMC shall be suspended.</p>	
218	<p>A LOMA, CLOMA, LOMR-F, or CLOMR-F may not be issued or based on preliminary data for a FEMA-contracted Flood Risk Project or community-initiated map revision; however, BFE data may be used from these sources if the effective SFHA does not have BFEs established and the preliminary data is the best available.</p>	
219	<p>Following the preparation of the LOMC determination document, the LOMC shall be included in the list of determinations that is to be sent to FEMA for official approval. Following approval, the requester shall be provided with FEMA's final determination. A copy of the LOMC determination document shall also be sent to the community CEO and floodplain administrator and to the requester when applicable.</p>	
220	<p>The reviews of LOMC requests shall be processed in accordance with Parts 65, 67, 70, and 72 of the NFIP regulations.</p>	
222	<p>When processing a LOMR for a FIRM that has been modernized (i.e., has a FIRM database), the map (FIRM and/or FBFM panels), Flood Profile, and data tables (i.e., Floodway Data and Summary of Discharges) enclosures shall be prepared in accordance with the FIRM Panel Technical Reference and the FIS Report Technical Reference. If the FIRM that is having a LOMR issued for it has not been modernized, either the current standards may be used (as indicated in the FIRM panel and FIS Report Technical References), or the standards in effect when the effective map and attachments were created.</p>	

SID #	Standard	Related Guidance
223	If a LOMR changes stillwater elevations, transect data, flood elevations, discharges, and/or floodway information, the supporting information in the FIS Report and FIRM Database shall be revised as necessary.	
224	For all Special Conversions, coordination and documentation activities shall be performed to convert the community to the Regular Phase of the NFIP.	
225	FEMA management system databases shall be maintained for Special Conversions.	
226	LOMC requests involving below-grade crawlspaces constructed within the SFHA shall follow guidance provided in FEMA Technical Bulletin 11-01.	
227	The Notice-to-Users revision only shall be used to correct errors or omissions in the FIS Report, FIRM Database, or on the FIRM that do not affect due process. A Notice-to-Users revision shall not change the effective date.	<ul style="list-style-type: none"> • Notice-to-User
228	All regulatory floodway changes must be coordinated with affected community officials and other stakeholders as early as possible.	<ul style="list-style-type: none"> • Stakeholder Engagement: Discovery
229	<p>Profiles shall be plotted as the projection of the stream invert and the flood surface(s) onto the flow path. The plots should show the locations of and clearly label:</p> <ul style="list-style-type: none"> • Each mapped cross section; • Splits and diversions; • Confluences with tributaries splits, and diversions; • Each stream crossing with symbology depicting the top of road and low chord elevations of modeled bridges and culverts along with the name of the bridge/culvert (e.g., Pine Street); • Extents of modeled hydraulic structures adjacent to the flooding source; • Upstream and downstream study limits of the flooding source; • Extent of backwater or flooding controlling the receiving stream and depiction of the backwater elevation along the Profile. 	
230	The FIRM panels must be derived directly from the FIRM database and must be in agreement with the information shown in the FIS Report.	<ul style="list-style-type: none"> • FIRM Graphics
232	Unless it can be demonstrated that the vertical and horizontal scale of the effective Flood Profiles are inadequate, re-analyzed streams must be produced using the same horizontal and vertical scales that were used in the effective Flood Profiles.	
234	FIS Reports exceeding 150 pages in length shall be subdivided into two or more volumes.	
235	If an FIS Report is published in 2 or more volumes, no volume shall exceed 100 pages.	

SID #	Standard	Related Guidance
236	For multi-volume FIS Reports, a single Table of Contents shall be produced for the entire report, and shall be included in all volumes.	
237	Preliminary FIS Reports must include a stamp on the cover to indicate the Preliminary status and the date of the Preliminary issuance.	
238	As outlined in the FIS Report Technical Reference, all numbered sections, tables and figures are required for every FIS Report prepared in compliance with the FIS Report Technical Reference, regardless of whether the topic addressed by that element is applicable to the Flood Risk Project.	
239	Table columns and names in the FIS Report must comply with the most current FIS Report Technical Reference unless FEMA Regional approval has been given to retain the prior FIS Report format.	<ul style="list-style-type: none"> • FIRM Index
240	When revising the FIS Report in compliance with the current FIS Report Technical Reference (as opposed to appending information to the former FIS report format), the FIS Report template at http://www.fema.gov/library/viewRecord.do?id=7577 must be used.	<ul style="list-style-type: none"> • FIRM Index
241	References used within the FIS Report text must match the citation listed in the Bibliography and References table.	
242	FIS Reports created in compliance with the FIS Report Technical Reference must use an "(Author Year)" format for inline citations.	
243	If a future conditions analysis is incorporated into the Flood Risk Project, the results shall be included in the FIRM database, FIRM, and FIS Report.	
245	The "Listing of NFIP Jurisdictions" and "Community Map History" tables in the FIS Report shall include all communities that fall within the county or jurisdiction whose FIS Report is being produced.	
246	Communities that have no Special Flood Hazard Areas identified shall be noted in the "Listing of NFIP Jurisdictions" and "Community Map History" FIS Report tables with a footnote.	
247	For FIS Reports produced in compliance with the FIS Report Technical Reference, all accredited levees, PALs, and non-accredited levees must be included in the "Levees" table of the FIS Report.	
248	All lettered or numbered cross sections must be shown on the Flood Profiles and, if a floodway was computed, must also be shown in the Floodway Data Table. Unlettered cross sections shown on the FIRM are not to be included on the Floodway Data Table or Flood Profiles.	

SID #	Standard	Related Guidance
249	In the "Community Map History" table for FIS Reports produced in compliance with the FIS Report Technical Reference, the "FIRM Revisions Date(s)" column shall include all FHBM and FIRM revisions, and must be updated during each revision to reflect the new PMR effective date. All PMR effective dates must be included for the communities that received updated FIRM panels, even if the PMR did not revise all the panels within that community.	
250	The FIRM Index shall be included in the FIS Report at a size of 11" x 17" for FIS Reports produced in compliance with the FIS Report Technical Reference.	<ul style="list-style-type: none"> • FIRM Index
251	For FIRM Indexes which require more than 1 page, the page number shall be indicated in the title block in the following manner: FLOOD INSURANCE RATE MAP INDEX (Sheet 1 of 2). A county locator map shall be added with a rectangle showing the extent of the current FIRM Index sheet.	<ul style="list-style-type: none"> • FIRM Index
252	For FIRM Indexes produced in compliance with the FIS Report Technical Reference, base map features that must be shown and labeled on the FIRM Index are HUC-8 watersheds and political jurisdictions. Community labels must also include the CID.	<ul style="list-style-type: none"> • FIRM Index
253	For FIRM Indexes produced in compliance with the current FIS Report Technical Reference, FIRM panels shown on the FIRM Index shall be labeled only with the four-digit panel number and suffix. The effective date must also be included and shall be placed directly beneath the FIRM panel number in "mm/dd/yyyy" format.	<ul style="list-style-type: none"> • FIRM Index
254	The FIRM Index shall identify unprinted panels with asterisks and footnotes that define the reason(s) for the panel(s) not being printed.	<ul style="list-style-type: none"> • FIRM Index
255	For FIS Reports produced in compliance with the FIS Report Technical Reference, every note that is shown on the Notes to Users on one or more FIRM panels must be included once in the Notes to Users section in the FIS Report.	<ul style="list-style-type: none"> • FIRM Graphics
256	Flood Profiles for Zone AE must show data for each of the 5 standard (10%-, 4%-, 2%-, 1%-, and 0.2%-annual-chance) flood events if they were calculated as part of the Flood Risk Project.	
257	The FIS Report deliverable to the MSC must be an unsecured PDF file, with as much searchable text as possible, and must be bookmarked in accordance with the direction outlined in the FIS Report Technical Reference. Embedded graphics, where necessary, must have a resolution of 400 dpi.	<ul style="list-style-type: none"> • FIRM Index
259	A description of all dams and other non-levee flood protection measures affecting the communities represented in the project area shall be included in the FIS Report.	
260	A description of any unusual floodway procedures that deviate from national policy, such as State-imposed or locally imposed surcharge limits of less than 1.0 foot for regulatory floodway, must be listed in the "Floodways" section of the FIS Report.	

SID #	Standard	Related Guidance
261	Counties that have an effective countywide FIS Report must remain countywide, regardless of whether they are updated to comply with the FIS Report Technical Reference or not.	
264	For cross-sections shown in areas of backwater flooding, elevations in the "Without Floodway" column of the Floodway Data Table shall not include backwater effects. The "Without Floodway" values must include a footnote stating, "Elevation Computed Without Consideration of Backwater Effects From (Source of Flooding)". The words "Backwater Effects" are to be replaced with "Tidal Effects," "Overflow Effects," "Ice Jam Effects," or "Storm Surge Effects," as needed, to reference the appropriate flooding situation.	
265	When a part of a regulatory floodway lies outside the jurisdiction, both the total floodway width, and the width within the jurisdiction, shall be listed in the FIRM database and Floodway Data Table.	
267	Only one stream shall be shown on any given Flood Profile panel.	
268	All communities whose FIS Report is being updated to comply with the FIS Report Technical Reference must receive a copy of the new FIS Report, regardless of whether they are affected by the new Flood Risk Project or are outside the project area.	
270	On the Flood Profiles for tributary streams, the 1-percent-annual-chance flood backwater from the main watercourse or water body shall be labeled as "Backwater From (Main Stream Name)."	
272	A vertical elevation scale of 1 inch equals 1, 2, 5, 10, or 20 feet is to be used for the Flood Profiles. Elevations shall be shown on the left side of the grid at 1-inch intervals within the profile elevation range.	
273	The 1%-annual-chance Flood Profile plots shall agree with the distances and elevations shown in the Floodway Data Table, with a maximum tolerance of 1/20 inch on the printed Flood Profile panel. Other features shown on the Profiles, such as cross-section labels and hydraulic structures, shall also be accurately plotted to within the 1/20 inch tolerance.	
274	The horizontal and vertical scales of the Flood Profiles shall be chosen so that that Flood Profile slopes are reasonable and can be easily interpreted by the user.	
275	The horizontal scale of the Flood Profile shall be labeled at 1-inch intervals along the bottom edge of the grid and legend box.	
277	For FIS Reports prepared in compliance with the FIS Report Technical Reference, any information that was included in Section 10 of a previous FIS Report using an approach known as "Revisions by Addendum" shall be incorporated into the relevant sections and tables of the current FIS Report.	
278	River stationing is to be referenced from a physical location such as a confluence or structure.	
279	Downstream flood elevations are to begin on the left edge of the Flood Profile.	

SID #	Standard	Related Guidance
280	Stream distances reported in the Floodway Data Tables, Profiles, and FIRM database must be measured along the profile baseline.	
281	Distance and elevation units used on a Flood Profile must be consistent with the units used in the Floodway Data Table.	
282	All FIRM panel symbology and labels must be clear and readable and clearly communicate the flood hazard information needed for insurance and mitigation purposes.	<ul style="list-style-type: none"> • FIRM Graphics
283	The FIRM panel "Notes to Users" section must contain notes referring the user to the FIS Report for a detailed legend and FIRM Index, to the MSC website for other digital products providing the NFIP contact information, and to the base map data source.	<ul style="list-style-type: none"> • FIRM Graphics • FIRM Index
284	The LiMWA note in the FIRM panel "Notes to Users" section shall include a legend.	<ul style="list-style-type: none"> • FIRM Graphics
285	All elements of the FIRM title block must be present and must adhere to the specifications in the FIRM Panel Technical Reference.	<ul style="list-style-type: none"> • FIRM Graphics
286	The jurisdiction names in the FIRM panel title block must include, at a minimum, the jurisdiction prefix (e.g., city, town, or village), jurisdiction name, and full State name. FIRM panels for individual jurisdictions shall also include the name of the county, except for jurisdictions that are officially classified as "Independent."	<ul style="list-style-type: none"> • FIRM Graphics
287	<p>When each new edition of a FIRM panel is prepared, the suffix for each revised FIRM panel shall be changed to the next alphabetical letter while skipping the letters "I" and "O".</p> <p>For first time countywide or partial countywide FIRMs, the map suffix should be one letter higher than the highest suffix of all jurisdictions included.</p>	<ul style="list-style-type: none"> • FIRM Graphics • FIRM Index
288	FIRM panels, FIRM Indexes, and FIS Reports shall follow the ID numbering schemes outlined in the FIRM Panel and FIS Report Technical References.	<ul style="list-style-type: none"> • FIRM Graphics • FIRM Index
289	The FIRM panel map collar must include a North Arrow, Scale Bar, and map projection and datum information.	<ul style="list-style-type: none"> • FIRM Graphics • FIRM Index
290	First-time modernized FIRM panels must be in countywide format unless the FIRM is for a multi-county jurisdiction that will retain its community-based FIRM format.	<ul style="list-style-type: none"> • FIRM Index
291	A determination to use Partial-Countywide FIRM panel and FIRM Database format must be coordinated with and approved by the FEMA Region and FEMA Headquarters.	<ul style="list-style-type: none"> • FIRM Index

SID #	Standard	Related Guidance
292	If partial countywide FIRM panel mapping is pursued, the FIRM title block will list all of the jurisdictions on the FIRM panel, but the ones not included in the partial countywide mapping will be noted as having their FIRMs and FIS Reports published separately.	
294	For partial countywide FIRM panel mapping, panel numbers must be assigned for the entire county, just as for a full countywide panel layout. Numbering of countywide FIRM panels must consider the numbering of the existing panels so as not to create two panels with the same number (e.g. 0250). If there would be two panels with the same number, start countywide numbering by going up to the first even thousand above the highest existing FIRM panel number.	<ul style="list-style-type: none"> • FIRM Index
295	When partial countywide mapping is processed, any existing community-based FIRM panels that overlap the partial countywide must be reissued with the overlapping area blanked out and the blanked out area must include a note referring the users to the partial countywide FIRM.	<ul style="list-style-type: none"> • FIRM Index
296	If a FIRM revision is being processed when there is a separate FBFM, the two maps should be combined into the new format FIRM using the new flood zone designations and the FBFM shall no longer exist as a separate map.	
297	On FIRM panels, symbolization and labeling of all base map, hydraulic, and flood theme features must be standardized as shown in the FIRM Panel Technical Reference.	<ul style="list-style-type: none"> • FIRM Graphics
300	All FIRM panels shall be printed to full page, portrait orientation, ARCH D map frames with a trimmed paper size of: Height 36" x Width 24. The title block must appear in the bottom right corner and be 5.3 inches wide by 9 inches in height.	<ul style="list-style-type: none"> • FIRM Graphics
301	FIRM panels must include a white border on all sides and must contain a title block on the bottom right corner, a legend, a Notes to Users section, and a Panel Locator section across the bottom of the panel, as outlined in the FIRM Panel Technical Reference.	<ul style="list-style-type: none"> • FIRM Graphics
304	All raster base maps used for FIRM panel preparation must be georeferenced and orthorectified.	<ul style="list-style-type: none"> • Base Map
305	A countywide FIRM must provide seamless spatial base map and flood hazard coverage within the county area for all jurisdictions shown on the FIRM.	<ul style="list-style-type: none"> • Base Map • FIRM Graphics • Stakeholder Engagement: Discovery
306	Any existing mismatches in floodplains and flood hazard information between communities and counties must be resolved as part of a FIS Report/FIRM update.	<ul style="list-style-type: none"> • FIRM Graphics • Stakeholder Engagement: Discovery
307	Raster base map image(s) used for FIRM panel preparation shall cover the entire jurisdiction being analyzed except in the cases of open water areas and/or areas that may be restricted due to security concerns.	<ul style="list-style-type: none"> • Base Map • FIRM Graphics

SID #	Standard	Related Guidance
308	<p>The FIRM base map is the horizontal reference data shown on the FIRM to assist in interpreting the areas impacted by the flood risk information shown. The term base map does not include topographic or elevation data. The following types of base map features must be depicted on the FIRM panel if they occur within the community:</p> <ul style="list-style-type: none"> • transportation features, including roads and railroads, hydrographic features, hydraulic structures • boundaries that identify county and State boundaries, corporate limits, ETJ areas, military lands, and tribal lands, and • U.S. PLSS features. 	<ul style="list-style-type: none"> • Base Map • FIRM Graphics
309	Any transportation feature shown and labeled on a Flood Profile shall be labeled on the FIRM panel.	<ul style="list-style-type: none"> • FIRM Graphics
310	Primary roads, as defined by the MAF/TIGER data, shall be shown and labeled on the FIRM panel.	<ul style="list-style-type: none"> • FIRM Graphics
311	On FIRM panels, all hydrographic features (streams, lakes, ponds, bays, and oceans) that have an identified flood hazard associated with them shall be labeled.	<ul style="list-style-type: none"> • FIRM Graphics
312	A profile baseline must be shown on FIRM panels for all flooding sources with profiles or otherwise established riverine BFEs (static elevations excluded), and for modeled riverine Zone A areas.	<ul style="list-style-type: none"> • FIRM Graphics
313	In areas of riverine flooding where no profile baseline is available but a flood hazard has been identified, the bank or centerline representation of the hydrographic feature must be shown on vector-based FIRM panels.	<ul style="list-style-type: none"> • FIRM Graphics
314	Hydrographic feature lines represented on FIRM panels must not obscure the Profile Baseline symbology.	<ul style="list-style-type: none"> • FIRM Graphics
315	All levees stored in the FIRM Database shall be labeled and symbolized on the FIRM panel as outlined in the FIRM Panel Technical Reference, with the appropriate accreditation status noted.	<ul style="list-style-type: none"> • FIRM Graphics
316	Hydraulic structures other than levees shall be labeled on the FIRM panel only if shown on the Flood Profile of the FIS Report. The label name must match what is shown on the Flood Profile. If 1%, 0.2%-annual-chance-flood discharge, and/or floodway are contained in the structure, a note must be placed on the FIRM panel near the future to refer to the highest contained discharge.	<ul style="list-style-type: none"> • FIRM Graphics
317	All political entities (including Extra-Territorial Jurisdictions) shall be depicted and labeled on the FIRM panel with the appropriate jurisdiction names and CIDs or area designator.	<ul style="list-style-type: none"> • FIRM Graphics
319	Any area shown on the FIRM panel as an Area Not Included shall be labeled with the entity's name and the notation "Area Not Included".	<ul style="list-style-type: none"> • FIRM Graphics
320	Vector base map features are not required on the FIRM in Areas Not Included.	<ul style="list-style-type: none"> • FIRM Graphics

SID #	Standard	Related Guidance
322	On FIRM panels, when boundaries of different types are coincident with each other or with base map features, only the highest priority feature shall be shown.	<ul style="list-style-type: none"> • FIRM Graphics
323	FIRM panels must show horizontal reference grids and corner coordinates selected, displayed and labeled as directed in the FIRM Panel Technical Reference.	<ul style="list-style-type: none"> • FIRM Graphics
332	If a printed FIRM panel falls within the area of a smaller-scale panel that is also printed, the smaller-scale panel shall show a breakout note in the blank area represented by the larger-scale panel (the breakout panel area). This note is placed in the center of the breakout panel area and specifies the larger-scale panel's map number and scale. The suffixes shall not be used in breakout panel notes (to avoid unnecessary updates in PMRs).	<ul style="list-style-type: none"> • FIRM Graphics
334	Each flood hazard zone shall be bounded by a SFHA/FLOOD ZONE BOUNDARY line type when adjacent to another flood hazard area of a different type or elevation.	<ul style="list-style-type: none"> • FIRM Graphics
335	Regulatory floodways shall be shown on the FIRM panel within the SFHA and, at lettered or numbered cross-section locations, floodway widths must agree with the values shown on the FDT in the FIS Report and the FIRM Database tables, within a maximum tolerance of 5 percent of the map scale or 5 percent of the distance, whichever is greater.	<ul style="list-style-type: none"> • FIRM Graphics
338	Special Flood Hazard Areas shall be labeled at least once with the flood zone on a FIRM panel and, if appropriate, with the static elevation, velocity, or depth.	<ul style="list-style-type: none"> • FIRM Graphics
339	Zone X areas that represent future conditions or areas protected by accredited levees shall be labeled on the FIRM panel in accordance with the FIRM Panel Technical Reference.	<ul style="list-style-type: none"> • FIRM Graphics
340	SFHAs with assigned static elevations, depths, or velocities shall have their static BFE, depth, or velocity value labeled on the FIRM panels in accordance with the FIRM Panel Technical Reference.	<ul style="list-style-type: none"> • FIRM Graphics
341	All BFE lines stored in the FIRM Database must be shown on FIRM panels.	<ul style="list-style-type: none"> • FIRM Graphics
342	Cross sections stored in the FIRM Database must be shown on the FIRM panels if they are attributed as one of the following line types: LETTERED, MAPPED and NOT LETTERED, MAPPED.	<ul style="list-style-type: none"> • FIRM Graphics
343	On FIRM panels and in FIRM Databases, lettered or numbered cross sections for each stream analyzed by detailed methods shall be labeled alphabetically or numerically from downstream to upstream.	<ul style="list-style-type: none"> • FIRM Graphics
345	On FIRM panels, lettered or numbered cross sections shall be symbolized and labeled as outlined in the FIRM Panel Technical Reference.	<ul style="list-style-type: none"> • FIRM Graphics

SID #	Standard	Related Guidance
346	On FIRM panels, all LETTERED, MAPPED and NOT LETTERED, MAPPED cross sections must be labeled with the regulatory WSEL value, rounded to the nearest tenth of a foot. All lettered or numbered cross section WSEL values must match the FDT in the FIS Report.	<ul style="list-style-type: none"> • FIRM Graphics
347	If unlettered cross sections and BFEs cannot be shown on the FIRM panel because of crowding due to steep terrain, a note shall be placed referring the user to the Flood Profiles in the FIS Report.	<ul style="list-style-type: none"> • FIRM Graphics
348	In the event that a cross section contains multiple water surface elevations the cross section shall be segmented and each segment labeled on the FIRM panel with its corresponding WSEL value and a hexagon.	<ul style="list-style-type: none"> • FIRM Graphics
349	On the FIRM panels and in the FIRM Database, LIMIT LINES shall be placed at the beginning and at the end of flow in every area analyzed by detailed methods and shall be depicted as specified in the FIRM Panel Technical Reference.	<ul style="list-style-type: none"> • FIRM Graphics
351	If transect lines are shown in the FIRM database they must be delineated and labeled on the FIRM panels.	<ul style="list-style-type: none"> • FIRM Graphics
352	The LiMWA must be included in the FIRM Database if it has been calculated as part of a coastal Flood Risk Project, and shall normally be shown on FIRM panels. All community requests to have the LiMWA removed from the FIRM must be received at least 2 months prior to the issuance of the LFD.	<ul style="list-style-type: none"> • FIRM Graphics • Stakeholder Engagement: Discovery
356	All FIRM panel notes, labels, and symbolization associated with CBRS and Otherwise Protected Areas shall conform to the specifications outlined in the FIRM Panel Technical Reference.	<ul style="list-style-type: none"> • Coastal Barrier Resources System • FIRM Graphics
357	Each FIRM panel must have a map legend that includes all the required elements and complies with the symbology as outlined in the FIRM Panel Technical Reference.	<ul style="list-style-type: none"> • FIRM Graphics
359	Data sources in the FIRM Database must be documented with Source Citations in the database and the metadata.	<ul style="list-style-type: none"> • Metadata
361	The FIRM Database digital data must be submitted in a series of layers that cover the entire geographic area being mapped and not in individual small tiles that cover limited geographic areas.	
363	The NFHL must be used as the source for effective digital FIRM Database data when starting FIRM updates, and used for mandatory edge matching at county/community boundaries.	<ul style="list-style-type: none"> • National Flood Hazard Layer (NFHL)
364	The FIRM Database must not contain duplicate spatial features.	
365	All included tables of the FIRM Database shall be documented in the metadata in accordance with the Metadata Profiles Technical Reference, and the software release of the personal geodatabase submitted shall also be documented.	<ul style="list-style-type: none"> • Metadata

SID #	Standard	Related Guidance
366	<p>FIRM Database tables must comply with the following database schema properties defined in the FIRM Database Technical Reference:</p> <ul style="list-style-type: none"> • Tables and Feature Classes • Spatial Reference Systems • Topology Rules • Domains 	<ul style="list-style-type: none"> • Base Map
367	<p>In the FIRM Database, all final revised FIRM panels shall get new FIRM panel Map Number suffixes and effective dates in the S_FIRM_Pan feature class.</p>	<ul style="list-style-type: none"> • FIRM Graphics
368	<p>All LOMRs that are located within the PMR panel footprint and are effective prior to the LOMC cutoff date (which is 60 days before the project's LFD date) must be incorporated into the FIRM Database.</p>	
369	<p>Floodplain boundary lines in the FIRM Database must be generalized to no more than an average of one vertex every 10 feet while still meeting FBS standards.</p>	
370	<p>FIRM Database Flood Theme and Base Map features shall not have disconnects, jogs, or missing features during edge matching and at community boundaries.</p>	<ul style="list-style-type: none"> • Base Map
371	<p>The following Regulatory deliverables must be submitted using the file formats and directory structure specified in the Data Capture Technical Reference.</p> <ul style="list-style-type: none"> • Transmittal Form • FIRM Database • Orthophotos (if applicable) • FIRM Scans • World Files • FIS Report • Transmittal to Community CEO • Community Map Action List • Inventory Worksheet for Each Community 	<ul style="list-style-type: none"> • Coastal Data Capture • Metadata
372	<p>Coincident features must share the same geometry, vertex for vertex, within the FIRM database files.</p>	
373	<p>The FIRM Database must be submitted using the schema found in the FIRM Database Technical Reference.</p>	
374	<p>BFEs (i.e., cross-section values supplemented with BFE lines where needed) must be shown at appropriate locations to allow map users to accurately interpolate flood elevations both horizontally and vertically.</p>	

SID #	Standard	Related Guidance
375	The S_Levee table is required for any Preliminary or Final FIRM Database that includes levees, floodwalls, closure structures, berms, embankments, or dikes that have been designed for flood control, whether or not they have been demonstrated to meet the NFIP requirements in 44 CFR 65.10.	
377	For PMRs, once the NFHL for a community is converted to the latest FIRM Database schema, all database submissions will also be required to conform to this schema. For non-FEMA funded external data studies and for portions of a study where the engineering is unrevised, attribute data associated with the schema that is not needed for FIRM production may be excluded from the study submittal with permission from the FEMA Regional Office. Each exclusion should be documented in the FIRM Database metadata file that accompanies the FIRM Database.	<ul style="list-style-type: none"> • Metadata • National Flood Hazard Layer (NFHL)
378	For PMRs where updated political boundaries are available for the entire extent of the FIRM database, the S_Pol_AR feature class shall be incorporated into the RFHL and shown on the FIRM Index.	<ul style="list-style-type: none"> • FIRM Index • National Flood Hazard Layer (NFHL)
379	For PMRs, the revised FIRM database layers within the PMR panel footprint shall be incorporated into the RFHL. Certain layers such as watershed boundaries, nodes, and political areas may extend outside of the PMR footprint.	<ul style="list-style-type: none"> • National Flood Hazard Layer (NFHL)
383	After preliminary issuance of the FIS Report and FIRM, any major changes must be coordinated with the FEMA Regional office.	
384	In the absence of a final CCO meeting a letter shall be sent to the community and interested stakeholders to document the decision to forego the meeting.	
385	Per 44 CFR 67.4, the News Release and Federal Register Proposed Flood Hazard Determination Notice shall include all communities affected by new or modified flood hazard information. The newspaper notice shall be published twice within the 10-days of notification of the community CEO, after publication of the Federal Register Proposed Flood Hazard Determination Notice.	
386	The community and other affected stakeholders must be notified when corrections to the News Release or Federal Register are required, including timelines for publishing corrections.	

SID #	Standard	Related Guidance
387	<p>The appropriate Federal Register Flood Hazard Determinations Notice proposing changes to flood hazard information shall be compiled for all communities affected by the addition or modification of flood hazards (i.e., the Proposed Notice for flood risk studies and the Interim Notice for LOMRs). The Notice shall include a hyperlink for the official FEMA website through which stakeholders can access the products depicting the proposed flood hazard changes. The Notice shall be submitted to the designated FEMA coordinator to route for concurrence and signature.</p> <p>FEMA shall coordinate with Office of Federal Register to ensure timely publication of the Notice in the Federal Register. The published Notice must be reviewed to ensure accuracy; if needed, corrections must be made, and other Project Team members must be notified of the correction.</p>	
388	<p>The statutory 90-day administrative appeal period cannot be extended; no appeals will be accepted after the 90-day appeal period.</p>	
389	<p>Written acknowledgement of all data submitted during the statutory appeal period shall be provided to the affected community.</p>	
390	<p>When performing new analyses and developing revised flooding information, appellants must tie the new BFEs, base flood depths, SFHA boundaries, SFHA zone designations, and/or regulatory floodway boundaries into those shown on the FIRM and in the FIS Report for areas not affected by the appeal.</p>	
391	<p>FEMA shall evaluate appeal submittals, and prior to LFD, FEMA or its designee must provide the community with a resolution letter and must provide a copy of the revised FIRM if changes were made as a result of the appeal.</p>	
392	<p>The Scientific Resolution Panel must be made available to communities that submit qualifying scientific and/or technical data during the 90-day administrative appeal period.</p>	
393	<p>A copy of the final FIRM must be delivered to affected communities 90 days before the effective date.</p>	
394	<p>The Engineering Library shall be the official repository for all technical engineering data including any LOMCs, TSDN and related Flood Risk Project documentation. Information shall be archived and maintained in accordance with FEMA records management standards.</p>	
395	<p>FEDD files must be submitted to FEMA for review 60 days before the LFD is scheduled to be issued.</p>	
396	<p>During post-preliminary processing the FEDD and all associated correspondence must be compiled for each affected community in accordance with all relevant regulations. When more than one entity is responsible for post-preliminary activities, each entity must ensure the FEDD and all related documentation is complete at the time the responsibility is transferred to the next entity.</p>	

SID #	Standard	Related Guidance
397	<p>The following data must be submitted at the end of each mapping project:</p> <ul style="list-style-type: none"> • FBS Self-Certification Document (submitted within 30 days after issuance of preliminary maps); • QA report stating compliance with the FBS standard. • Revised Floodplain Boundary Standard Self-Certification Document (submitted within 30 days after issuance of the LFD if floodplain boundaries were revised during the post-preliminary phase); • Correspondence file including any documentation not previously submitted during earlier tasks or as part of the FEDD file related to coordination and processing decisions made during the course of the Flood Risk Project. • FEDD for each affected community • FEDD Checklist for each FEDD file • TSDN Checklist and Certification form 	
398	The FEDD files must be separate for each community.	
400	Map Service Center deliverables must be uploaded through the MIP for all Flood Risk Projects.	<ul style="list-style-type: none"> • Metadata
401	The LFD date must be no sooner than 60 days after the end of the 90-day administrative appeal period or following resolution of all appeals, whichever is later.	
402	The LFD package shall be submitted to FEMA HQ for review and approval prior to issuing LFDs to affected communities.	
403	FEMA shall publish a final FHD notice in the Federal Register no later than three (3) months following issuance of the LFD.	
404	The Compendium of Flood Map Changes shall be published every 6 months. Publication shall occur within 15 days of the close of the 6-month reporting period.	
405	2-4 weeks before the effective date of the revised map, the revalidation package shall be submitted to FEMA for review and approval prior to issuing the revalidation letters.	
406	The LOMC-VALID letter shall be provided to the community CEO and floodplain administrator and the LOMC Subscription Service Coordinator before the effective date of the revised FIRM(s).	
407	<p>FEMA will widely distribute the following at regular intervals:</p> <ul style="list-style-type: none"> • final LOMCs with attachments • final SOMAs • revalidation letters 	
408	Requests for Letters of Determination Review (LODRs) shall be processed.	

SID #	Standard	Related Guidance
409	Suspension notification letters shall be distributed to communities that have not yet adopted NFIP compliant ordinances within 90 and 30 days prior to the FIRM effective date.	
410	Over the life of a Flood Risk Project, NFIP eligibility shall be reviewed and related correspondence shall be prepared for newly-eligible communities.	
411	FEMA will publish a notice of community eligibility in the Federal Register.	
412	For coastal Flood Risk Projects, the LiMWA must be calculated, where appropriate.	
413	Locally-provided, -sourced, or -validated building footprint, location, and/or population data shall be the only acceptable data sources to be used to populate structure and population count attributes within the CSLF dataset.	<ul style="list-style-type: none"> • Changes Since Last FIRM • Stakeholder Engagement: Discovery
414	Flood risk datasets derived from new or updated data must reflect the regulatory elevations as shown on the preliminary FIRM, if applicable. If floodplain delineations are altered as a result of appeals or other changes during the post-preliminary process, the Changes Since Last FIRM dataset shall be updated to reflect those changes.	<ul style="list-style-type: none"> • Changes Since Last FIRM • Flood Depth & Analysis Grids
415	Flood risk datasets derived from effective data must reflect the effective regulatory elevations as shown on the FIRM.	<ul style="list-style-type: none"> • Changes Since Last FIRM • Flood Depth & Analysis Grids
416	Depth and Analysis Grids must share the same terrain and bathymetry source datasets as the engineering models.	<ul style="list-style-type: none"> • Flood Depth & Analysis Grids

SID #	Standard	Related Guidance																																			
417	<p>The minimum datasets associated with the Flood Risk Project are defined as follows:</p> <table border="1" data-bbox="233 147 1398 886"> <thead> <tr> <th colspan="2" data-bbox="233 147 814 228">Non-Regulatory Product/Dataset</th> <th data-bbox="814 147 1115 228">New Flood Hazard Analysis Conducted</th> <th data-bbox="1115 147 1398 228">No New Flood Hazard Analysis Conducted</th> </tr> </thead> <tbody> <tr> <td colspan="2" data-bbox="233 228 814 293">Flood Risk Database</td> <td data-bbox="814 228 1115 293">Required</td> <td data-bbox="1115 228 1398 293">Required</td> </tr> <tr> <td data-bbox="233 293 302 743" rowspan="6" style="writing-mode: vertical-rl; transform: rotate(180deg);">Flood Risk Dataset</td> <td data-bbox="302 293 814 367">Changes Since Last FIRM (CSLF)</td> <td data-bbox="814 293 1115 367">Required¹</td> <td data-bbox="1115 293 1398 367">N/A</td> </tr> <tr> <td data-bbox="302 367 814 440">Water Surface Elevation Grids</td> <td data-bbox="814 367 1115 440">Required²</td> <td data-bbox="1115 367 1398 440">N/A</td> </tr> <tr> <td data-bbox="302 440 814 513">Flood Depth Grids</td> <td data-bbox="814 440 1115 513">Required²</td> <td data-bbox="1115 440 1398 513">N/A</td> </tr> <tr> <td data-bbox="302 513 814 586">Percent Annual Chance & Percent 30-year Chance Grids</td> <td data-bbox="814 513 1115 586">Required³</td> <td data-bbox="1115 513 1398 586">N/A</td> </tr> <tr> <td data-bbox="302 586 814 675">Flood Risk Assessment</td> <td data-bbox="814 586 1115 675">Required (AAL⁴ and Refined⁵)</td> <td data-bbox="1115 586 1398 675">Required (AAL⁴)</td> </tr> <tr> <td data-bbox="302 675 814 743">Areas of Mitigation Interest (AoMI)</td> <td data-bbox="814 675 1115 743">Required</td> <td data-bbox="1115 675 1398 743">Required</td> </tr> <tr> <td colspan="2" data-bbox="233 743 814 816">Flood Risk Map</td> <td data-bbox="814 743 1115 816">Required</td> <td data-bbox="1115 743 1398 816">Required</td> </tr> <tr> <td colspan="2" data-bbox="233 816 814 886">Flood Risk Report</td> <td data-bbox="814 816 1115 886">Required</td> <td data-bbox="1115 816 1398 886">Required</td> </tr> </tbody> </table> <p data-bbox="233 898 1356 927">¹ CSLF is optional in areas where digital modernized floodplain boundaries are not available for the effective FIRM</p> <p data-bbox="233 938 1087 1060">² Riverine studies: 10%, 4%, 2%, 1%, "1%+", and 0.2% annual-chance floods; Coastal studies: only the 1% annual chance flood; Levee studies: Riverward/Seaward side - same as Riverine or Coastal, Landward side - only the scenario(s) used to delineate SFHA boundary</p> <p data-bbox="233 1068 384 1097">³ Riverine only</p> <p data-bbox="233 1105 1308 1162">⁴ AAL data only from the FEMA 2010 AAL Study; Both riverine and coastal areas will have 10%, 2%, 1%, 0.5%, and 0.2% annual-chance floods, and Annualized;</p> <p data-bbox="233 1170 1062 1325">⁵ Analysis can be conducted at census block or user-defined facility level. Riverine studies: 10%, 4%, 2%, 1%, and 0.2% annual-chance floods, and Annualized; Coastal studies: only the 1% annual chance flood; Levee studies: Riverward/Seaward side - same as Riverine or Coastal, Landward side - only based on the landward depth grid</p>	Non-Regulatory Product/Dataset		New Flood Hazard Analysis Conducted	No New Flood Hazard Analysis Conducted	Flood Risk Database		Required	Required	Flood Risk Dataset	Changes Since Last FIRM (CSLF)	Required ¹	N/A	Water Surface Elevation Grids	Required ²	N/A	Flood Depth Grids	Required ²	N/A	Percent Annual Chance & Percent 30-year Chance Grids	Required ³	N/A	Flood Risk Assessment	Required (AAL ⁴ and Refined ⁵)	Required (AAL ⁴)	Areas of Mitigation Interest (AoMI)	Required	Required	Flood Risk Map		Required	Required	Flood Risk Report		Required	Required	<ul style="list-style-type: none"> • Areas of Mitigation Interest • Changes Since Last FIRM • Coastal-Specific Non-Regulatory Datasets • Flood Depth & Analysis Grids • Flood Risk Assessments • Flood Risk Database • Flood Risk Map • Flood Risk Report
Non-Regulatory Product/Dataset		New Flood Hazard Analysis Conducted	No New Flood Hazard Analysis Conducted																																		
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Flood Risk Map		Required	Required																																		
Flood Risk Report		Required	Required																																		
418	Depth grids for open water shall reflect the depth of flooding above normal pool.	<ul style="list-style-type: none"> • Flood Depth & Analysis Grids 																																			

SID #	Standard	Related Guidance
419	The extent of water surface elevation change grids shall, at a minimum, reflect those areas that were both SFHA before and after the revision.	<ul style="list-style-type: none"> • Flood Depth & Analysis Grids
420	The Flood Risk Report will only report on the extent of the flood risk data that lies within the Flood Risk Project area.	<ul style="list-style-type: none"> • Flood Risk Report
421	To ensure privacy, sensitive claims data will be aggregated and/or generalized at the centroid of the census block and represented as a point.	<ul style="list-style-type: none"> • Areas of Mitigation Interest • Flood Risk Map • Stakeholder Engagement: Discovery
423	All fields in the Flood Risk Database Technical Reference must be populated unless marked as [E]nhanced.	<ul style="list-style-type: none"> • Flood Risk Database
424	As an outcome of Discovery, a tiling structure must be defined for products.	<ul style="list-style-type: none"> • Flood Risk Database
425	The National Flood Hazard Layer (or other comparable dataset with all effective FIRMs and LOMRs incorporated) shall be the source for the effective flood hazard area data for non-regulatory products.	<ul style="list-style-type: none"> • Changes Since Last FIRM
426	<p>Each Flood Risk Report shall include the following sections:</p> <ol style="list-style-type: none"> i. Preface ii. Table of Contents 1. Introduction 2. Risk Analysis 3. Flood Risk Analysis Results 4. Actions to Mitigate Flood Risk 5. Acronyms and Definitions 6. Additional Resources 7. Data Used to Develop Flood Risk Products 	<ul style="list-style-type: none"> • Flood Risk Report

SID #	Standard	Related Guidance
427	<p>The Flood Risk Report must include the following tables:</p> <p>Project Specific Tables:</p> <ul style="list-style-type: none"> • List of all the communities in the project area; • CSLF summary; • Risk Assessment summary; <p>Community Specific Tables:</p> <ul style="list-style-type: none"> • Community overview; • CSLF summary; • Risk Assessment summary; • AoMI summary 	<ul style="list-style-type: none"> • Areas of Mitigation Interest • Changes Since Last FIRM • Flood Risk Assessments • Flood Risk Report
428	<p>The Flood Risk Map must illustrate flood risk in the project area, potential mitigation opportunities, and include the following elements:</p> <ul style="list-style-type: none"> • Map body • Title block • Map legend • Project locator • North arrow • Map scale 	<ul style="list-style-type: none"> • Areas of Mitigation Interest • Flood Risk Assessments • Flood Risk Map
429	<p>The following Non-regulatory deliverables must be submitted using the file formats and directory structure specified in the Data Capture Technical Reference.</p> <ul style="list-style-type: none"> • Flood Risk Database • Depth and Analysis Grids • Metadata file • Full text of the Flood Risk Report with bookmarks, a hyperlinked table of contents and section headings. • Flood Risk Map 	<ul style="list-style-type: none"> • Flood Depth & Analysis Grids • Flood Risk Database • Flood Risk Map • Flood Risk Report • Metadata
431	<p>For Flood Risk Product SHP and DBF file formats, domain-based fields shall contain the actual descriptive values, not the numeric or alphanumeric coded value.</p>	<ul style="list-style-type: none"> • Flood Risk Database
432	<p>Datasets in the FRD must be delivered in their entirety even if a portion of the dataset lies outside the define project footprint.</p>	<ul style="list-style-type: none"> • Changes Since Last FIRM • Flood Depth & Analysis Grids • Flood Risk Assessments • Flood Risk Database

SID #	Standard	Related Guidance
433	Non-regulatory datasets must be delivered within the Flood Risk Database and must not be tiled or subdivided.	<ul style="list-style-type: none"> • Changes Since Last FIRM • Flood Depth & Analysis Grids • Flood Risk Assessments • Flood Risk Database
438	Hazus 2.1 shall be the source for Census block boundaries within the FRD.	<ul style="list-style-type: none"> • Flood Risk Assessments • Flood Risk Database
440	The Flood Risk Map must be derived directly from the Flood Risk Database. The Flood Risk Database must be in agreement with the information shown in the Flood Risk Report.	<ul style="list-style-type: none"> • Flood Risk Database • Flood Risk Map • Flood Risk Report
441	Text in the FRR_Custom and FRR_Project tables must be stored as an Office Open XML 2.0 compliant markup fragment containing only text and styles.	<ul style="list-style-type: none"> • Flood Risk Database
442	<p>Non-regulatory flood risk datasets must comply with the following database schema properties defined in the Flood Risk Database Technical Reference:</p> <ul style="list-style-type: none"> • Tables and Feature Classes • Raster Datasets • Spatial Reference Systems • Topology Rules • Relationship Classes • Domains 	<ul style="list-style-type: none"> • Areas of Mitigation Interest • Changes Since Last FIRM • Coastal-Specific Non-Regulatory Datasets • Flood Depth & Analysis Grids • Flood Risk Assessments • Flood Risk Database
443	In order to maintain privacy, the L_Claims table, if there are less than five (5) claims, five (5) repetitive loss claims, or five (5) severe repetitive loss claims in a community, then the relevant value field shall be set to null.	<ul style="list-style-type: none"> • Areas of Mitigation Interest • Flood Risk Database
444	Levee systems can only be accredited in their entirety when compliance with 44 CFR Part 65.10 is demonstrated.	
445	FEMA will not grant extensions to the 24-month PAL period.	
446	Levee accreditation must be based upon detailed H&H analyses.	
447	If the levee system does not continue to meet the criteria within 44 CFR Section 65.10, FEMA shall initiate the levee de-accreditation process.	

SID #	Standard	Related Guidance
448	A levee system shall only be designated by FEMA as a PAL if the levee system is already accredited on the effective FIRM and, the owner of the levee system or the community is attempting to compile levee accreditation documentation to demonstrate continuation of compliance with 44 CFR 65.10. The opportunity for a PAL designation is only offered one time for any given system.	
449	If a levee system qualifies for the PAL designation, the affected communities will be given an opportunity to sign a PAL agreement.	
450	A structure shall only be considered a levee when it can be demonstrated that the structure was designed and has been operated and maintained as a levee. Structures that cannot meet these requirements cannot be considered for accreditation under 44 CFR 65.10.	
452	Floodway boundaries shall be placed on the riverside of a levee unless the community specifically requests otherwise, or where hydraulic calculations demonstrate a floodway is warranted elsewhere.	
501	For Flood Risk Projects that have at least one FIRM panel produced in compliance with the current FIRM Panel Technical Reference, but whose FIS Report is not produced in compliance with the current FIS Report Technical Reference (i.e., the FIS Report is retaining its legacy format) the FIRM Legend and Notes to Users must be included as an appendix to the FIS Report per the current FIS Report Technical Reference.	
502	For FIRM Indexes produced in compliance with the current FIS Report Technical Reference, all required elements of the FIRM Index title block and Index collar shall be present and symbolized as outlined in the Technical Reference.	<ul style="list-style-type: none"> • FIRM Index
503	For FIRM Indexes produced in compliance with the current FIS Report Technical Reference, the symbology and labeling of all features depicted on the FIRM Index shall adhere to the specifications outlined in the Technical Reference.	<ul style="list-style-type: none"> • FIRM Index
504	For FIS Reports produced in compliance with the FIS Report Technical Reference, map repositories for all communities must be present and correct in the "Map Repositories" FIS Report table. Flood Risk Projects whose FIS Reports are not produced in compliance with the current FIS Report Technical Reference (i.e., the FIS Report is retaining its legacy format per FEMA Regional approval), but whose FIRM Index is produced in compliance with the FIS Report Technical Reference, must include a correctly populated "Map Repositories" table in the FIS Report. FIRM Indexes that are not produced in compliance with the FIS Report Technical Reference must include the map repository information on the Index.	<ul style="list-style-type: none"> • FIRM Index

SID #	Standard	Related Guidance
505	FIS Reports not produced in compliance with the FIS Report Technical Reference (per FEMA Regional approval), but whose FIRM Index is produced in compliance with the Technical Reference, must include a correctly populated "Listing of NFIP Jurisdictions" table in the FIS Report. FIRM Indexes that are not produced in compliance with the FIS Report Technical Reference must include the Listing of Communities table on the FIRM Index.	<ul style="list-style-type: none"> <li data-bbox="1606 191 1774 219">• FIRM Index
506	Flood Profile notes and labels must be correct and agree with the FIRM and Floodway Data Table (if applicable).	
507	The FIRM, Flood Profiles and Floodway Data Tables must all be in agreement with each other as it relates to the depiction of flood hazards and hydraulic structures.	

SID #	Standard	Related Guidance
508	<p>Quality Reviews 1 through 8 must be conducted. Associated requirements for each review are as follows:</p> <ul style="list-style-type: none"> • QR1: The draft FIRM database shall be uploaded to the MIP for auto-validation and must pass before QR2 is conducted. • QR2: The preliminary FIRM database shall be uploaded to the MIP for auto-validation and must pass before QR3 is conducted. • QR3: The preliminary FIS Report, FIRM, and SOMA shall be reviewed using standardized checklists located at http://www.fema.gov/library/viewRecord.do?id=7577 after the work has been self-certified as meeting FEMA standards. The FIS Report, SOMA, FIRM and FIRM database shall not be issued at preliminary until written certification is provided indicating that all issues cited at this review were properly addressed and resolved. • QR4: This review validates the Proposed FHD Notice, Appeal Period Docket, and 90-day Start Letter(s). If a 90-day appeal period is required, the proposed flood hazard determination notice information must be entered into the FHD Notices on the Web tool. An approved docket must be received from FEMA prior to the issuance of the 90-day Start Letter(s) • QR5: The FIRM database shall be auto-validated in the MIP and a visual review shall be conducted using standardized checklists located at http://www.fema.gov/library/viewRecord.do?id=7577 to compare the FIRM database to the printed FIRM and all cited issues must be resolved before the LFD will be distributed. • QR6: This review validates the LFD prior to the distribution of the final products. As part of the "Prepare LFD Docket" MIP task, the LFD Summary Sheet/Docket, FEDD Files, and LFD Questionnaire must be prepared and submitted, concurrent with QR5 and QR7. All cited issues must be resolved before the LFD will be distributed. • QR7: The final FIS Report, FIRM and associated paperwork shall be reviewed using standardized checklists located at http://www.fema.gov/library/viewRecord.do?id=7577 before delivery to the MSC and all cited issues must be resolved before the LFD will be distributed. • QR8: A review of the FIS Report, FIRM, MSC paperwork, and delivery manifest shall be conducted by the FEMA Map Service Center using standardized checklists located at http://www.fema.gov/library/viewRecord.do?id=7577 and all cited issues must be resolved before delivery of the final products to the end users. 	<ul style="list-style-type: none"> • Quality Review
509	<p>All Quality Compliance Check issues noted during the QR1 through QR8 process must be fully addressed, documented and resolved.</p>	<ul style="list-style-type: none"> • Quality Review
510	<p>Standardized checklists must be used at FEMA-designated Quality Reviews. Those checklists, which are located at http://www.fema.gov/library/viewRecord.do?id=7577 must be retained as quality records, and delivered as part of the TSDN.</p>	<ul style="list-style-type: none"> • Quality Review

SID #	Standard	Related Guidance
512	Self-Certification of compliance with FEMA standards must be provided before a QR3 review may be executed. A template for this requirement is available here (http://www.fema.gov/library/viewRecord.do?id=7577).	<ul style="list-style-type: none"> • Quality Review
513	Written certification must be provided, documenting that all QR3 non-compliance citations were properly addressed and resolved, in order to complete the QR3 process. A template for this requirement is available at http://www.fema.gov/library/viewRecord.do?id=7577 .	<ul style="list-style-type: none"> • Quality Review
514	Following the QR4 review, any identified errors must be corrected prior to the 90-day Start letter distribution.	<ul style="list-style-type: none"> • Quality Review
515	The 90-day comment period for the Federal Register Proposed FHD Notice and the 90-day statutory appeal period must overlap by at least one day. If the 90-day appeal period does not begin prior to the end of the Federal Register 90-day comment period, in coordination with FEMA, the Federal Register publication must be withdrawn and the FHD notice must be republished.	
516	The standard FHD Notice must be posted with the correct newspaper publication dates and appeal period start and end dates on FEMA's website prior to issuing the 90-day start letters.	
517	The FIRM Database (including metadata) and the georeferenced FIRM image files must be submitted to the MIP and FEMA (or their designee) must be notified at least 60 days prior to the anticipated LFD date.	<ul style="list-style-type: none"> • Metadata
518	All outstanding map changes must be incorporated into the FIRM before proceeding with the QR5 database and visual review.	<ul style="list-style-type: none"> • Quality Review
519	The FIS Report, FIRM, and FIRM database must pass QR5, QR6, and QR7 before the LFD may be distributed.	
520	At least 45-days before the projected LFD date the final LFD letters, Part 67 Final Notice, and Final SOMAs must be submitted. No less than 4-weeks before the LFD the final LFD Summary Sheet/Dockets and LFD Questionnaires must be consolidated and sent to FEMA HQ for approval.	
521	At least 60-days prior to the projected LFD date after receiving a passing QR5 auto-validation report for the FIRM database, the QR5 visual, QR6, and QR7 reviews at the "Produce Final Map Products" MIP task must be conducted.	<ul style="list-style-type: none"> • Quality Review
522	As part of the "Prepare LFD Docket" MIP task, the LFD Summary Sheet/Docket, FEDD Files, and LFD Questionnaire must be submitted, concurrent with Quality Reviews 5 and 7.	
523	On the SOMA, structure removals must not be included in Category 1; LOMRs must not be included in Category 2; and LOMRs and single-determination LOMCs must not be included in Category 4.	

SID #	Standard	Related Guidance
524	When multiple determination LOMAs and LOMR-Fs include both removal and non-removal determinations, and all determinations remain the same based on the new or revised mapping, the case must be included in Category 2 and the new zone must be listed as 'X' in the MIP SOMA Tool; on the Revalidation Letter the new zone must be changed to 'Multiple' if it was formerly shown as "X".	
525	On the SOMA, the map number and map suffix must be listed in the new map panel field for each LOMC and the old map panel must be listed for the old panel field.	
526	All cases included on the SOMA in Category 2 must be listed with the new zone listed as 'X' in the MIP SOMA Tool.	
527	Any LOMCs issued prior to the effective date of the current respective FIRM panel must be included on the SOMA if they are listed on a current revalidation letter for the community.	
528	The SOMA must include the community name, CID, case number, date issued and project identifier for each LOMC listed.	
529	The FIRM Effective date must be listed on the Final SOMA.	
530	All requests for flood map revisions based upon new or modified flood control structures shall include an analysis of the potential adverse impacts of the structure on flooding within, and adjacent to, the area protected by the structure. For coastal structures, this analysis must also evaluate the impacts of the structure on erosion within, and adjacent to, the protected area.	
531	Metadata for non-regulatory flood risk datasets must comply with the Metadata Technical Reference.	<ul style="list-style-type: none"> • Flood Risk Database • Metadata
532	Attribute domains for non-regulatory flood risk datasets must comply with the Domain Tables Technical Reference.	<ul style="list-style-type: none"> • Flood Risk Database
533	Metadata for FIRM databases must comply with the Metadata Profiles Technical Reference.	<ul style="list-style-type: none"> • Metadata
534	Attribute domains for FIRM databases must comply with the Domain Tables Technical Reference.	
535	When a PMR is processed that will only partially include an effective LOMR, all FIS Report components of the LOMR (including Flood Profiles and Floodway Data Tables) must be included in the revised FIS Report that is issued with the PMR. When the partially-included LOMR is re-issued, it must not include any FIS Report components and it will only include revisions for the FIRM panel(s) not revised with the PMR. The LOMR must be re-issued within three days of the FIS Report / FIRM effective date.	

SID #	Standard	Related Guidance
536	For Atlantic Ocean and Gulf of Mexico coastal Flood Risk Projects, the 1-percent-annual-chance water level datum, above which the dune reservoir volume will be calculated for erosion analyses, will include storm surge, tidal effects, and wave setup components.	
537	LOMRs for Atlantic Ocean and Gulf of Mexico study areas where wave setup was evaluated as part of the effective coastal analysis shall use the effective still water elevations (including wave setup) for the calculation of dune reservoir volume in the dune erosion analysis. LOMRs where wave setup was not evaluated as part of the effective coastal analysis shall use the effective still water elevations (without wave setup) from the FIS Report for calculating dune reservoir volumes, unless the revision request includes new analyses of still water elevations and wave setup, in which case the reference water level shall include the wave setup component.	
538	FEMA will not fund any efforts solely related to certifying data for levee accreditation or making determinations of the levee's structural conditions.	
539	The natural valley floodplain behind non-accredited levee systems shall be modeled and depicted as an SFHA, except when additional analysis indicates an alternate treatment. The natural valley floodplain behind non-accredited levee systems shall only be depicted as Zone D when freeboard deficient, sound reach, overtopping, and structural-based inundation procedures are implemented.	
540	Levee systems must be hydraulically independent whereby if one system fails, the area behind another system is not inundated.	
541	A Local Levee Partnership Team (LLPT) must be established with participation of diverse stakeholders based on the complexity and scope of the levee system under evaluation. The options discussed by the LLPT members and FEMA's decisions regarding the appropriate analysis and mapping procedures to be used, must be documented and made available to stakeholders.	
542	If there are levee systems on both sides of a flooding source, or multiple systems that overlap, the extents of the natural valley area and reach specific SFHAs for each system will be analyzed independently assuming the other systems remain in place.	

SID #	Standard	Related Guidance					
543	<p>The following reach analysis approaches and corresponding data requirements shall be utilized when analyzing non-accredited levee systems:</p>						
		Reach Analysis Procedures					
	Data Element	Link to CFR	Sound Reach	Freeboard Deficient	Overtopping	Structural-Based Inundation	Natural Valley
	Elevation Information for the Levee Crest and Toe	N/A	Required	Required	Required	Required	N/A
	BFE + Freeboard Less than Levee Crest	44CFR65.10(b)(1)	Required	N/A	N/A	N/A	N/A
	BFE Less than Levee Crest	N/A	Required	Required	N/A	N/A	N/A
	Operations and Maintenance Plan	44CFR65.10(c)	Required	Required	Required	Recommended	N/A
	Structural Design Requirements	44CFR65.10(b)(2) 44CFR65.10(b)(4) 44CFR65.10(b)(5) 44CFR65.10(b)(6) 44CFR65.10(b)(7)	Required	Required	Required	N/A	N/A
Inspection Reports	44CFR65.10(c)(2)(iv)	Required	Required	Required	Recommended	N/A	
Evaluation of Overtopping Erosion Potential	N/A	N/A	N/A	Required	N/A	N/A	
544	<p>The final SFHA delineation shown on the FIRM landward of the non-accredited levee system shall be based on a composite of flooding results from each independently analyzed reach, any interior drainage flooding of the system, and ponding against the landward side of the levee.</p>						
545	<p>The resulting floodplain from the analysis of a Structural Based Inundation reach must reflect the fact that a breach could occur at any location along the reach.</p>						
546	<p>If BFEs are to be shown on the FIRM landward of non-accredited levee systems, they shall be based on the highest elevation of the composite analysis and mapping.</p>						
547	<p>If topographic breaklines are produced and submitted, the Topographic Breakline Topology Rules outlined in the Data Capture Technical Reference must be followed.</p>						

SID #	Standard	Related Guidance
549	<p>The metadata files submitted for each applicable task must comply with the Metadata Profiles Technical Reference and must document the data being submitted and include the following elements:</p> <ul style="list-style-type: none"> • Identification Information • Data Quality Information • Spatial Reference Information • Entity and Attribute Information • Distribution Information • Metadata Reference Information 	<ul style="list-style-type: none"> • Metadata
550	<p>If a LOMR results in a new or increased BFE or a new or increased SFHA, the requester must notify the property owner(s) of the impact of the LOMR on their property.</p>	
551	<p>For PMRs, the footprint shall be defined as the boundary of the FIRM panel(s) affected by the PMR's study area.</p>	
552	<p>A Quality Management Plan that prescribes protocols for ensuring consistent compliance with FEMA Standards must be in place.</p>	<ul style="list-style-type: none"> • Quality Management

SID #	Standard	Related Guidance
553	<p>LOMCs shall be categorized on the SOMA as follows:</p> <p>Category 1 (LOMCs Incorporated) - Includes those LOMRs (and some LOMAs and LOMR-Fs) whose results are unaffected by new or revised flood hazard data, and whose results can and will be incorporated into the revised FIRM panel(s). Large metes-and-bounds or multi-lot property removal LOMR-Fs are sometimes incorporated through Category 1 when scale limitations do not prohibit it; although typically, these LOMAs and LOMR-Fs will be revalidated through Category 2. Structure removal (both single and multiple determinations) LOMCs cannot be incorporated due to scale limitations and therefore shall not be included in Category 1.</p> <p>Category 2 (LOMCs Not Incorporated) - Includes those LOMAs and LOMR-Fs whose results are unaffected by new or revised flood hazard data but could not be incorporated into the revised FIRM panel because of map scale limitations, or because the property or structure was determined to be outside the SFHA as shown on the effective FIRM panel and remains outside the SFHA on the revised FIRM panel(s). These LOMCs are included on the Revalidation Letter that becomes effective one (1) day after the revised FIRM panels become effective. Multiple-determination LOMCs that include denials may be included in this category if all determinations in the LOMC are unaffected by the new or revised flood hazard data.</p> <p>Category 3 (LOMCs Superseded) - Includes those LOMCs whose results will not be reflected on the revised FIRM panel because the flood hazard data on which the determinations are based are being superseded by new detailed flood hazard data, or the information available was not sufficient to make a determination.</p> <p>Category 4 (LOMCs To Be Redetermined) - Includes those LOMAs and LOMR-Fs issued for multiple lots or structures for which new determinations must be made because the determination for one or more properties or structures has changed as a result of the new or revised flood hazard information, and therefore cannot be revalidated.</p>	
555	RFHL to NFHL submissions must include all up-to-date revisions and study data inclusive in a DFIRM ID.	<ul style="list-style-type: none"> • National Flood Hazard Layer (NFHL)
556	All Flood Risk Projects must have a communications plan designed to keep project stakeholders informed of all key decisions, draft findings and finished outputs. The plan shall also be designed to regularly engage key stakeholders in dialog about local risks and potential actions to manage and reduce those risks.	<ul style="list-style-type: none"> • Discovery • Stakeholder Engagement: Discovery

SID #	Standard	Related Guidance
600	<p>An administrative appeal period must be offered for physical map revisions and letters of map revision where:</p> <ul style="list-style-type: none"> • New BFEs or base flood depths are proposed or currently effective BFEs or base flood depths have been modified; • New SFHAs are proposed or the boundaries of currently effective SFHAs have been modified; • New SFHA zone designations are proposed or currently effective SFHA zone designations have been modified; or • New regulatory floodways are proposed or the boundaries of currently effective floodways that have been modified. <p>In order to qualify as an appeal, scientific and/or technical data demonstrating these changes are incorrect must be provided.</p>	
601	<p>The Community Map Repository address for each community listed in the Federal Register Flood Hazard Determination notice must be a physical address (i.e., not a P.O. Box) confirmed by the community. Additionally, the repository address must be consistent among all related products (FIS, FIRM Index, FIRM Database, FHD Web tool, and Federal Register), both hard copy and online versions, before starting the statutory 90-day appeal period.</p>	
602	<p>For the analysis and mapping of flood hazards associated with levee systems, if available, data and documentation in the USACE National Levee Database (NLD) or from local communities, tribal entities or other Federal/State agencies should be leveraged.</p>	
603	<p>Requests for a determination of adequate progress toward completion of flood protection systems must meet the data and documentation requirements outlined in 44 CFR 61.12, except where superseded by Section 19, Part a, of the Homeowner Flood Insurance Affordability Act, 42 U.S.C. § 4014(e). Zone A99 requests may be submitted for projects constructing or reconstructing flood protection systems. Requests will not be limited to projects with Federal funding, and the present value of the system can be used to meet the requirements of 44 CFR 61.12.b.</p>	
604	<p>Map revision requests to reflect flood control system restoration projects with a Zone AR designation must meet the data and documentation requirements outlined in 44 CFR 65.14, except where superseded by Section 19, Part b, of the Homeowner Flood Insurance Affordability Act, 42 U.S.C. § 4014(f). Zone AR requests may be submitted for levees in riverine and coastal areas, except when the landward flood zone of the existing structure would be defined as a Coastal High Hazard Area. Requests will be reviewed without regard to Federal funding or participation, and restoration projects must be complete or meet the requirements of 44 CFR 61.12 within a specified timeframe, not to exceed 10 years, from the date the community submits the request for a Zone AR determination by FEMA.</p>	

SID #	Standard	Related Guidance
605	<p>Flood Insurance Rate Maps, FIRMettes, and NFHL Databases are the official FEMA digital products. The official FEMA digital products and printed versions produced from the official digital products are all equivalent to each other and represent official FEMA designations of the areas of special flood hazard, base flood elevations, insurance risk zones and other regulatory information, provided that all other geospatial data shown on the printed product meets or exceeds any accuracy standard promulgated by FEMA. Products using FEMA's regulatory data must include a statement that they conform to this standard in order to be used in place of the official FEMA digital products.</p>	
606	<p>When a coordinate grid is shown on the FIRM or when the FIRM or NFHL Database version is available, the horizontal location of the flood hazard information is defined with respect to the primary coordinate system shown on the FIRM or stored in the FIRM or NFHL Database product. The horizontal location of the flood hazard information is not defined by its relationship to the base map features such as streets. If there are conflicting interpretations of the precise horizontal location of the areas of special flood hazard, the conflict shall be resolved using the grid coordinates shown on the printed FIRM or stored in the FIRM or NFHL Database products rather than the base map features.</p>	
607	<p>NFHL submittals must not contain a single dataset (i.e. DFIRM_ID) which includes future-effective LOMRs with effective dates separated by more than one business day.</p>	
608	<p>rFHL submittals must be submitted in a geodatabase format that matches the current NFHL schema in the FIRM Database Technical Reference.</p>	
609	<p>DFIRM study data incorporated into the NFHL must be obtained from the FINAL_DFIRM_DB task MIP folder for the associated Risk MAP project case number.</p>	
610	<p>All NFHL data superseded by a Risk MAP or LOMR project must be removed from the rFHL prior to submission, and the NFHL must replace all data for a submitted dataset (i.e. DFIRM_ID) in its entirety.</p>	
611	<p>NFHL submittals must contain a unique identifier within the primary key fields for all records within a dataset (i.e. DFIRM_ID) and maintain all primary and foreign key relationships as defined in the FIRM Database Technical Reference.</p>	

Guidance Table:

ID #	Guidance Title and Location in the FEMA library	Related Standards
1	Base Map	41 , 147 , 148 , 149 , 150 , 157 , 188 , 304 , 305 , 307 , 308 , 366 , 370
2	General Coastal Considerations	88 , 89 , 90 , 93 , 96 , 138 , 139
3	Coastal Study Documentation and Intermediate Data Submittals	61 , 85 , 87 , 111 , 187
4	Coastal Barrier Resources System	170 , 356
5	Discovery	1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , 9 , 10 , 11 , 12 , 13 , 14 , 15 , 16 , 17 , 18 , 19 , 20 , 21 , 22 , 23 , 24 , 26 , 27 , 29 , 30 , 31 , 33 , 34 , 35 , 36 , 141 , 556
6	FIRM Graphics	80 , 105 , 106 , 107 , 108 , 109 , 133 , 149 , 151 , 230 , 255 , 282 , 283 , 284 , 285 , 286 , 287 , 288 , 289 , 297 , 300 , 301 , 305 , 306 , 307 , 308 , 309 , 310 , 311 , 312 , 313 , 314 , 315 , 316 , 317 , 319 , 320 , 322 , 323 , 332 , 334 , 335 , 338 , 339 , 340 , 341 , 342 , 343 , 345 , 346 , 347 , 348 , 349 , 351 , 352 , 356 , 357 , 367
7	FIRM Index	150 , 151 , 172 , 173 , 239 , 240 , 250 , 251 , 252 , 253 , 254 , 257 , 283 , 287 , 288 , 289 , 290 , 291 , 294 , 295 , 378 , 502 , 503 , 504 , 505
8	Flood Risk Database	417 , 423 , 424 , 429 , 431 , 432 , 433 , 438 , 440 , 441 , 442 , 443 , 531 , 532
9	Flood Risk Map	417 , 421 , 428 , 429 , 440
10	Flood Risk Report	417 , 420 , 426 , 427 , 429 , 440
11	Metadata	152 , 181 , 359 , 365 , 371 , 377 , 400 , 429 , 517 , 531 , 533 , 549
12	National Flood Hazard Layer (NFHL)	136 , 363 , 377 , 378 , 379 , 555
13	Changes Since Last FIRM	413 , 414 , 415 , 417 , 425 , 427 , 432 , 433 , 442
14	Flood Depth & Analysis Grids	414 , 415 , 416 , 417 , 418 , 419 , 429 , 432 , 433 , 442

ID #	Guidance Title and Location in the FEMA library	Related Standards
15	Flood Risk Assessments	417 , 427 , 428 , 432 , 433 , 438 , 442
16	Areas of Mitigation Interest	417 , 421 , 427 , 428 , 442 , 443
17	Coastal-Specific Non-Regulatory Datasets	417 , 442
18	Notice-to-User	213 , 214 , 227
19	Quality Management	187 , 552
20	Quality Review	190 , 508 , 509 , 510 , 512 , 513 , 514 , 518 , 521
21	Stakeholder Engagement: Project Planning (Not Yet Published)	35 , 83 , 154
22	Stakeholder Engagement: Discovery	17 , 18 , 19 , 20 , 21 , 22 , 23 , 24 , 26 , 27 , 29 , 30 , 31 , 33 , 34 , 35 , 56 , 57 , 99 , 141 , 143 , 146 , 154 , 188 , 228 , 305 , 306 , 352 , 413 , 421 , 556
23	Stakeholder Engagement: Due Process (Not Yet Published)	
24	Vertical Datum	118 , 119 , 120 , 121 , 122 , 123 , 124 , 125 , 126
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Technical Reference Table:

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[Technical Reference: FIS Report \(Nov 2014\)](#)

[Technical Reference: FIRM Panel \(May 2014\)](#)

[Technical Reference: FIRM Database \(Nov 2014\)](#)

[Technical Reference: Data Capture \(Nov 2014\)](#)

[Technical Reference: Flood Risk Database \(Nov 2014\)](#)

[Technical Reference: Domain Tables \(Nov 2014\)](#)

[Technical Reference: Metadata Profiles \(Nov 2014\)](#)

[Coordinated Needs Management Strategy \(CNMS\) Technical Reference – May 2013](#)

Templates and Other Resources Table:

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[Checklist: Non-Regulatory Checklists \(May 2014\)](#)

[Checklist: Pre-QR3 Self Certification \(May 2014\)](#)

[Checklist: Regulatory Checklists \(May 2014\)](#)

[Guidance Resource: Changes Since Last FIRM \(CSLF\) Zone Change Matrix \(May 2014\)](#)

[Metadata Profile: Alluvial Fan Study Datasets v105 \(Nov 2014\)](#)

[Metadata Profile: Basemap Datasets v105 \(Nov 2014\)](#)

[Metadata Profile: Coastal Study Datasets v105 \(Nov 2014\)](#)

[Metadata Profile: Discovery v102 \(Nov 2014\)](#)

[Metadata Profile: Draft, Preliminary and Final FIRM Datasets v104 \(Nov 2014\)](#)

[Metadata Profile: Floodplain Mapping and Redelineation Datasets v105 \(Nov 2014\)](#)

[Metadata Profile: FRD v103 \(Nov 2014\)](#)

[Metadata Profile: Hydraulics Datasets v105 \(Nov 2014\)](#)

[Metadata Profile: Hydrology Study v105 \(Nov 2014\)](#)

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[Metadata Profiles Technical Reference XML- FRD](#)

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[Operating Guidance 2-11: FRM MXD data settings file for ESRI ArcGIS v9.3 \(Oct 2011\)](#)

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[Procedure Memorandum 43: Correction Period Followup Letter, Scenario A2](#)

[Procedure Memorandum 43: De-accreditation Notification Letter](#)

[Procedure Memorandum 43: Initial Notification Letter, Scenario A: Levee Not in Federal System \(NLOC\)](#)

[Procedure Memorandum 43: Initial Notification Letter, Scenario E: Levee in Federal System \(Data Problem\)](#)

[Procedure Memorandum 43: Initial Notification Letter, Scenario A: Levee Not in Federal System](#)

[Procedure Memorandum 43: Initial Notification Letter, Scenario B: Levee in Federal System](#)

[Procedure Memorandum 43: Initial Notification Letter, Scenario B: Levee in Federal System \(NLOC\)](#)

[Procedure Memorandum 43: Initial Notification Letter, Scenario C1: Levee in Federal System \(NCP\)](#)

[Procedure Memorandum 43: Initial Notification Letter, Scenario C2: Levee in Federal System \(CP\)](#)

[Procedure Memorandum 43: PAL Agreement - USACE Owned, Operated, & Maintained](#)

[Procedure Memorandum 43: PAL Agreement Scenario A1-Levee Not in Federal System](#)

[Procedure Memorandum 43: PAL Agreement, Scenario A1: Levee Not in Federal System](#)

[Procedure Memorandum 43: PAL Agreement, Scenario A1: Levee Not in Federal System \(NLOC\)](#)

[Procedure Memorandum 43: PAL Agreement, Scenario A2: Levee Not in Federal System](#)

[Procedure Memorandum 43: PAL Agreement, Scenario A2: Levee Not in Federal System \(NLOC\)](#)

[Procedure Memorandum 43: PAL Agreement, Scenario B: Levee in Federal System](#)

[Procedure Memorandum 43: PAL Agreement, Scenario B: Levee in Federal System \(NLOC\)](#)

[Procedure Memorandum 43: PAL Agreement, Scenario C2: Levee in Federal System](#)

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[Procedure Memorandum 43: PAL Progress Report - Template](#)

[Procedure Memorandum 43: PAL Progress Report Reminder Letter - Template](#)

[Procedure Memorandum 51: Attachment A - Initial Contact Letter Template](#)

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[Procedure Memorandum 51: Attachment B - Follow Up to Draft Work Map Meeting Template](#)

[Procedure Memorandum 51: Attachment C - Agreement Received Response Template](#)

[Procedure Memorandum 51: Attachment D - Agreement Not Received Response Template](#)

[Procedure Memorandum 51: Attachment E - Community Agreement Template](#)

[Procedure Memorandum 56: CNMS Sample Validation Process Documentation Checksheet Version 1.0](#)

[Procedure Memorandum 56: XML file - CNMS FGDB Schema](#)

[Procedure Memorandum 62: Flood Elevation Determination Docket \(FEDD\) Checklist](#)

[Procedure Memorandum 62: Technical Study Data Notebook \(TSDN\) Inventory Checklist](#)

[Prototype: Coastal Flood Risk Map \(May 2014\)](#)

[Prototype: Dams Flood Risk Map \(May 2014\)](#)

[Prototype: Discovery Guidance Report \(May 2014\)](#)

[Prototype: FEMA Notice to Users \(NTU\) Request \(May 2014\)](#)

[Prototype: Flood County USA Ortho \(May 2014\)](#)

[Prototype: Flood County USA Vector \(May 2014\)](#)

[Prototype: Levees Flood Risk Map \(Feb 2013\)](#)

[Prototype: Riverine Flood Risk Map \(Nov 2011\)](#)

[Prototype: Sample Flood Risk Map \(FRM\) High Resolution- \(October 2011\)](#)

[Prototype: Sample Flood Risk Map \(FRM\) Low Resolution- \(October 2011\)](#)

[Schema: Discovery \(Nov 2014\)](#)

[Schema: FIRM Database \(Nov 2014\)](#)

[Schema: FRD \(Nov 2014\)](#)

[Schema: NFHL DB \(Nov 2014\)](#)

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[Template: Discovery Guidance Report \(May 2014\)](#)

[Template: FEMA Notice to Users \(NTU\) \(May 2014\)](#)

[Template: FEMA Notice to Users \(NTU\) Request \(May 2014\)](#)

[Template: Flood County USA Ortho MXD \(May 2014\)](#)

[Template: Flood County USA Vector MXD \(May 2014\)](#)

[Template: Flood Insurance Study \(FIS\) Report \(May 2014\)](#)

[Template: Flood Risk Products Index Form \(Nov 2014\)](#)

[Template: Flood Risk Report \(May 2014\)](#)

[Template: Inventory Worksheet \(Nov 2014\)](#)

[Template: Newspaper FHD Notice Flood Risk Projects \(Nov 2014\)](#)

[Template: Request to Mail Appeal Start Letters \(Nov 2014\)](#)

[Templates: Metadata XMLs \(Nov 2014\)](#)

[Tool: Seclusion Decision Worksheet \(Nov 2014\)](#)

Appendix A

Acronyms and Abbreviations Used in the Risk MAP Standards

Item	Full Translation
2D	Two-Dimensional
AoMI	Areas of Mitigation Interest
BFE	Base Flood Elevation
CBRS	Coastal Barrier Resources System
CCO	Consultation Coordination Officer
CDS	Customer and Data Services
CEO	Chief Executive Officer
CFR	Code of Federal Regulations
CID	Community Identifier
CIS	Community Information System
CLOMA	Conditional Letter of Map Amendment
CLOMR	Conditional Letter of Map Revision
CLOMR-F	Conditional Letter of Map Revision based on Fill
CNMS	Coordinated Needs Management Strategy
CP	Correction Period
CRS	Community Rating System
CSLF	Changes Since Last FIRM
CTP	Cooperating Technical Partner
DBF	Database File
DEM	Digital Elevation Model
DFIRM	Digital Flood Insurance Rate Map
DVT	FIRM Database Verification Tool
ESRI	Environmental Systems Research Institute
ETJ	Extraterritorial Jurisdiction
FBFM	Flood Boundary and Floodway Map
FBS	Floodplain Boundary Standard
FDT	Floodway Data Table
FEDD	Flood Elevation Determination Docket
FEMA	Federal Emergency Management Agency
FGDB	File Geodatabase
FHBM	Flood Hazard Boundary Map
FHD	Flood Hazard Determination
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study

Item	Full Translation
FRD	Flood Risk Database
FRM	Flood Risk Map
FRR	Flood Risk Report
FVA	Fundamental Vertical Accuracy
GCS	Geographic Coordinate System
GIS	Geographic Information System
H&H	Hydrologic & Hydraulic
HQ	Headquarters
HUC	Hydrologic Unit Code
LFD	Letter of Final Determination
LiDAR	Light Detection and Ranging or Laser Imaging Detection and Ranging
LiMWA	Limit of Moderate Wave Action
LLPT	Local Levee Partnership Team
LODR	Letter of Determination Review
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision based on Fill
MAF/TIGER	Master Address File/Topologically Integrated Geographic Encoding and Referencing
MIP	Mapping Information Platform
MSC	Map Service Center
MXD	ArcMap Document (file extension)
NAD83	North American Datum 1983
NAVD88	North American Vertical Datum 1988
NCP	No Correction Period
NFHL	National Flood Hazard Layer
NFIP	National Flood Insurance Program
NGO	Non-Governmental Organization
NLOC	Non-Levee Owner Community
NSRS	National Spatial Reference System
NSSDA	National Standard for Spatial Data Accuracy
NVUE	New, Validated, or Updated Engineering
OFA	Other Federal Agency
PAL	Provisionally Accredited Levee
PDF	Portable Document Format
PLSS	Public Land Survey System

Item	Full Translation
PMR	Physical Map Revision
QA	Quality Assurance
QA/QC	Quality Assurance / Quality Control
QR	Quality Review
RFHL	Regional Flood Hazard Layer
RPO	Regional Project Officer
SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SHP	Shapefile (file extension)
SOMA	Summary of Map Actions
SVA	Supplemental Vertical Accuracy
TIN	Triangulated Irregular Network
TSDN	Technical Support Data Notebook
TWL	Total Water Level
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
WSEL	Water Surface Elevation
XML	Extensible Markup Language (file extension)
XS	Cross Section