

Letter of Map Change (LOMC) Guidelines

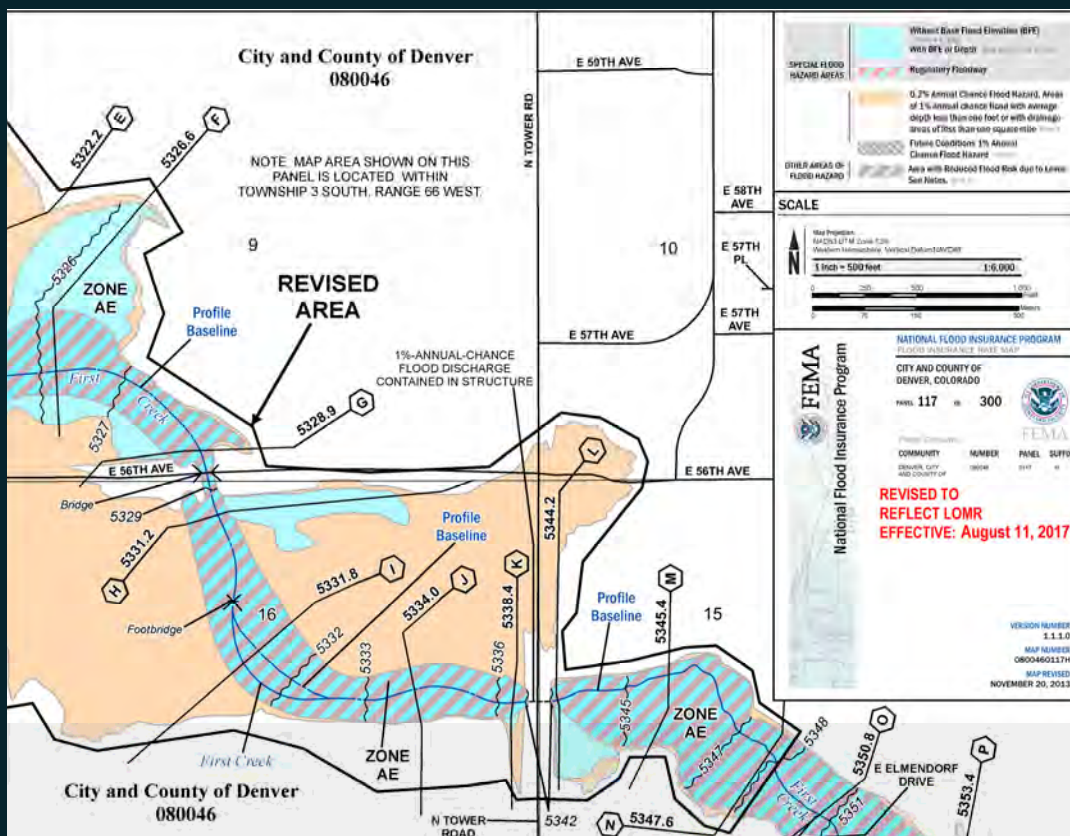
February 2022

MHFD

MILE HIGH FLOOD DISTRICT

Protecting People, Property, and our Environment.

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1. INTRODUCTION AND PURPOSE

These LOMR/CLOMR (referred together as Letters of Map Change or LOMC) Guidelines offer assistance and direction for engineering consultants, communities, or any interested party in preparing a digital Letter of Map Revision (LOMR) or Conditional Letter of Map Revision (CLOMR) submittal for review by the Mile High Flood District (MHFD). Under the Federal Emergency Management Agency's (FEMA's) Cooperating Technical Partner initiative, the MHFD (formerly the Urban Drainage and Flood Control District) has been reviewing LOMRs and CLOMRs which fall within the District's boundaries since 2001.

We believe that these guidelines will greatly assist in the time and expense associated with the LOMC review procedure. Similarly, we believe that the use of these guidelines will assist in standardizing and defining basic submittal requirements and improve the overall consistency of each individual project. Other advantages to the use of these guidelines include:

- Reduced time and costs for LOMC submittal preparation and review
- Standardization to make submittals easier to prepare and review
- Quality control checks for common items to reduce review time and expenses

Users are also encouraged to review and make use of the guidelines established for Flood Hazard Area Delineation (FHAD) reports in the MHFD, specifically with respect to floodplain delineation recommendations that are not otherwise covered by this document. These guidelines can be downloaded at the following web address:

<https://mhfd.org/services/floodplain-management/>

Additionally, FEMA has provided an MT-2 (Revisions) Guidance Document that should also help with the preparation and review of any LOMC, both in and outside the District's boundaries. The MT-2 Guidance Document, as well as other guidance documents, standards, and technical references, are available to download using the link below:

<https://www.fema.gov/flood-maps/guidance-reports/guidelines-standards>

2. SUBMITTAL PROCEDURES

Traditional paper LOMC submittals are no longer accepted within the MHFD. All submittals must be digitally submitted using either email, cloud-based file exchange services such as OneDrive, Dropbox, etc., FTP, or using FEMA's Online Letter of Map Change service which is available at the following web address:

<https://hazards.fema.gov/femaportal/onlinelomc/signin>

The required review fee must also be received before a request can be reviewed or processed. The current review fee information can be found at the following web address:

<https://www.fema.gov/flood-maps/change-your-flood-zone/status/flood-map-related-fees>

The LOMC review fees presented at the fee web site have two different price categories based on using either the Online LOMC system or "Paper Forms." Since paper LOMC submittals are no longer accepted within the MHFD boundaries, the "Paper Forms" fee category applies to an initial LOMC submittal made using any digital submission format other than FEMA's Online LOMC system.

Please note that the fee schedule can be changed at any time and the fee in effect at the time of the initial submittal must be provided.

Electronic submittal of the review fees is highly encouraged, however, paper checks can still be submitted for a LOMC within the MHFD boundaries, based on the "Paper Forms" fee category, as long as the appropriate fee and relevant MT-2 Form are submitted. Paper checks should be made out to the National Flood Insurance Program. Please contact the District directly if a paper check needs to be submitted for your LOMC.

3. LOMC SUBMITTAL ITEMS

The following items should be included with all LOMC submittals in electronic form:

3.1 Report Text

Recommended items to include in the LOMR or CLOMR report include sections describing the following:

- ***Purpose:*** This section describes the purpose of the request. Describe all pertinent project elements and list all stakeholders and/or requestors. Applicants should also describe any special requirements of the desired outcome (e.g., does the requester want the current FEMA zone designation changed in any way).
- ***Background:*** Describe the background of the flooding source and any pertinent history. This section should also mention any previous studies (i.e., FHADs, Master Plans, etc.) and include a description of any effective LOMRs or approved CLOMRs which impact the project's revision reach.
- ***Study Limits:*** List the impacted Flood Insurance Rate Map (FIRM) panels, effective dates, impacted communities and counties, and describe the proposed revision reach.

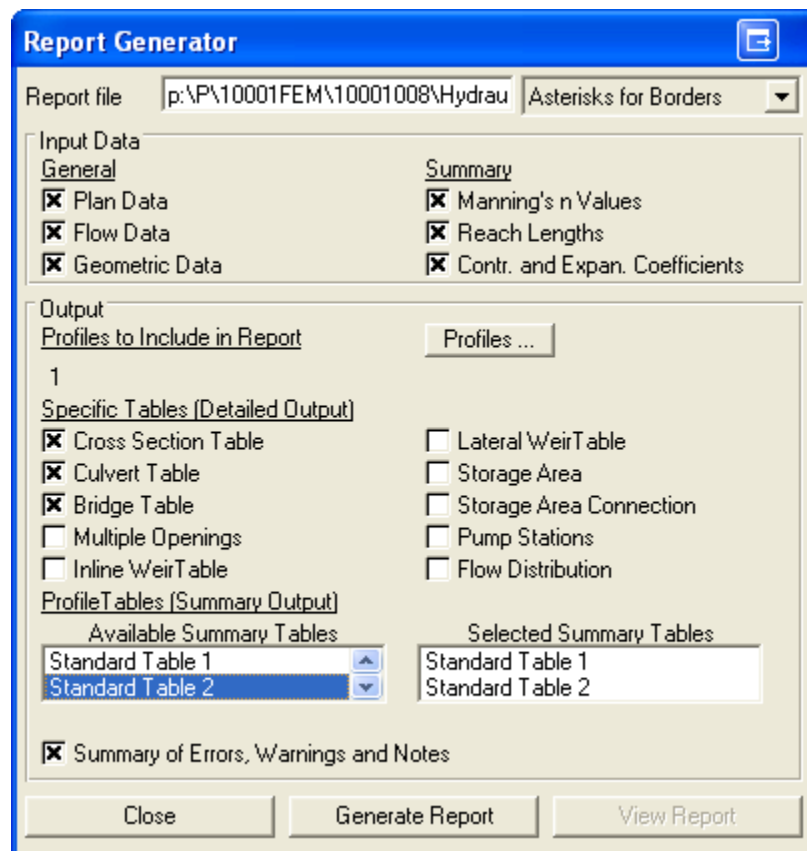
- **Mapping:** Describe the source of the topographic mapping used for the project including the mapping company, date mapped or flown, scale, contour interval, vertical datum, and control point data (e.g., NGS or MHFD). This section should also identify the horizontal datum (e.g., NAD 83) and mapping projection (e.g., State Plane Central) used for the base mapping. If the mapping utilizes ground coordinates, please provide the conversion factor to grid coordinates or a table showing XY values for several known points in both grid and ground coordinates.
- **Hydrology:** This section identifies the source of the discharge information used during the hydraulic analysis. If the project hydrology has been changed or differs from the adopted FEMA discharges in any way, the details, results, or changes should be summarized here.
- **Hydraulics:** The hydraulics section outlines the hydraulic modeling effort for the LOMC request starting with the Effective model and ending with the Proposed (CLOMR) or Post-Project (LOMR) hydraulic models. This section should also include the source of the Effective model (e.g., a FHAD, Master Plan, previous LOMR, etc.) and can include discussions related to the relevant changes and development of the: Duplicate Effective, Corrected Effective, Existing, and Proposed/Post-Project hydraulic models. Depending on the request, this section can also discuss changes to the regulatory floodway, Manning's 'n' values, tie-ins to the effective information, etc.
- **NFIP Regulation Compliance:** Describes what National Flood Insurance Program (NFIP) regulations are required to be met with the request and how they were met. These regulations may include, but are not limited to: tie-in requirements, Regulation 65.12, draft public floodway revision notification, and draft property owner notifications.
- **References:** Lists the references used during the preparation of the LOMC submittal as well as what hydrologic and/or hydraulic programs were used, including the program version.

3.2 Hydrologic and/or Hydraulic Models

Executable copies of all hydrologic and/or hydraulic models used in the LOMC submittal should be included in electronic form. Whenever possible, Duplicate Effective, Corrected Effective, Existing, and Proposed/Post-Project hydraulic models should be organized within the same HEC-RAS project file using plan files in HEC-RAS rather than separate HEC-RAS project files.

HEC-RAS reports should also be submitted electronically. These reports should be generated using the recommended settings shown below. The reports can be submitted in their original format, as a PDF, or using Microsoft Word.

Similarly, hydraulic cross-section plots can also be provided electronically in PDF format and should be placed with the HEC-RAS report files.



Proposed construction plans are required for a CLOMR submittal whereas, as-built drawings and/or survey information are required for a LOMR submittal. These items require certification by a professional engineer or land surveyor registered in the State of Colorado and can be submitted in PDF form. A single PDF file containing multiple sheets (preferred method) or multiple PDF files can be included.

3.4 FEMA MT-2 Forms

The required FEMA MT-2 Forms must be filled out and submitted in digital form with all the required signatures of the requester, community official(s) responsible for floodplain management, and a Colorado registered professional engineer or land surveyor. FEMA

also provides an MT-2 Form Instructions guide to assist with completing the required forms. The forms and instructions are available to download at the following web address:

<https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-2>

3.5 Common NFIP Regulation Requirements

Meeting NFIP regulation requirements is necessary for any LOMC submittal. This section of the guidelines highlights some of the more common requirements and where more information and assistance on fulfilling the NFIP regulations can be obtained. MT-2 Form 2, Section D, lists some of the most common regulatory requirements for a LOMC submittal and should be filled out completely and included with all submittals. Additionally, the MT-2 Form Instructions contains useful guidance for filling out Section D as well as a more detailed explanation regarding the listed regulatory requirements.

The MHFD is available to assist communities and submitting engineers with meeting FEMA's NFIP regulation requirements for a LOMC submittal. Please contact the Floodplain Management Program for further assistance.

Neither this section of the LOMC Guidelines nor the MT-2 Form Instructions contain all the regulations governing FEMA or the NFIP. Section 44 of the Code of Federal Regulations (CFR) contains the policies and procedures governing FEMA and parts 60 and 65 of that section contains the regulatory requirements of the NFIP. The CFR can be viewed using the following link:

<https://www.govinfo.gov/>

3.5.1 Tie-Ins

All submittals must meet the specific tie-in requirements set forth by FEMA for tying into the effective information. For a detailed study area, an area with flooding designated as Zone AE, the revised Base Flood Elevations (BFEs) must tie-in at both the upstream and downstream ends of the revised reach within 0.5 foot of the effective profile elevations. The width of the Special Flood Hazard Area (SFHA), the area inundated by the 1%-annual-chance flood event, also called the base flood, must have a tie-in top-width within 5% of the effective FIRM scale (e.g., 25 feet for a 1" = 500 feet scale FIRM). For Zone AE areas which include a regulatory floodway, the floodway elevations must also be within the 0.5-foot profile requirement and the floodway encroachment stations at both the upstream and downstream limits must match the effective encroachment stations. For areas not studied by detailed methods, an area designated as Zone A, the revised BFEs must be within 0.5-foot of the pre-project conditions model (either Corrected Effective or Existing) at both the upstream and downstream revision limits and the width of the SFHA must also tie-in within 5% of the effective FIRM scale.

3.5.2 CLOMR ESA Compliance

Documentation of compliance with the Endangered Species Act (ESA) is required for all submitted CLOMRs. Submittals must include both the ESA determination and the documentation, or report, used to determine the compliance with the ESA. FEMA maintains a web page which gives an overview of obtaining ESA compliance and the various ways to provide the required documentation for their review at the following web address:

<https://www.fema.gov/flood-maps/change-your-flood-zone/esa>

3.5.3 Section 65.12 Requirements

When NFIP regulations section 65.12 applies, there are several conditions that must be met including: individual legal notification to all impacted property owners, a certified statement indicating that no insurable structures are impacted by the increased BFEs, and an evaluation of alternatives which would not result in the BFE increases. FEMA's MT-2 Form Instructions contain sample individual legal notification letters, and Appendix A within this document also contains an example of a certified statement regarding insurable structures.

3.5.4 BFE and SFHA Property Owner Notifications

Notifications are also required for all property owners experiencing any adverse impacts due to the proposed changes (i.e., increases in BFE or SFHA width when compared to the effective). The MT-2 Form Instructions also contain sample notification letters which fulfill this separate requirement. In addition to the required notifications, the impacted community or submitting engineer must also provide certification that all property owners experiencing adverse impacts have, in fact, been notified of the changes and that no insurable structures are impacted from the increased BFEs. Appendix B contains a statement which meets this requirement.

3.5.5 Floodway Revision Notifications

When a LOMC proposes any (i.e., positive or negative) changes to the boundaries of the regulatory floodway, notifications specific to the differences in the floodway are required. These notifications must be community-based notifications and can be sent out as individual notifications or using a public notice distributed by the community such as a notice in the local newspaper. If individual notifications are utilized, the letters can either be sent on community letterhead or each impacted community can submit a statement (see Appendix B) by the community confirming that all affected property owners have been notified of the proposed floodway revision within their jurisdiction.

FEMA does allow the various types of notifications to be combined into a single property owner notification letter and provides several templates for this purpose in the MT-2 Form Instructions. MHFD recommends submitting draft versions of the notification letters with

an initial LOMC submittal so the reviewer can ensure they meet FEMA's requirements before they are sent out to the impacted property owners.

3.6 Floodplain Workmaps

A certified topographic floodplain workmap showing the relevant portions of the effective, existing (or pre-project for a LOMR), and proposed (or post-project for a LOMR) floodplains and floodways must be submitted for a LOMC request. The workmaps are required to be submitted in both certified PDF and electronic source file formats. The digital source file workmaps must use either AutoCAD or GIS formats, unless prior authorization is given by the MHFD in advance of the submittal. For AutoCAD formats, the digital submittal must include the DWG file and pertinent associated files. For GIS formats, the digital submittal must include the MXD file with relative shapefiles and other references. At a minimum, the workmaps must contain all applicable information summarized below:

- Effective floodplain boundaries (1%- and 0.2%-annual chance)
- Existing/Corrected Effective floodplain boundaries (1%-annual chance)
- Proposed/Post-Project floodplain boundaries (1%- and 0.2%-annual chance)
- Effective floodway boundaries
- Proposed/Post-Project floodway boundaries
- Location and alignment of all hydraulic cross-sections with Proposed/Post-Project BFE labels for each section shown to the nearest tenth of a foot
- Stream centerlines including the stationing which correlates with the submitted hydraulic models
- Road and any other pertinent structure alignments (e.g., Dams, Levees, Lateral Structures, etc.)
- Current community easements and boundaries
- Adjacent property boundaries
- Boundaries of the requester's property
- Registered professional engineer certification
- Referenced vertical datum (e.g., NAVD, NGVD, etc.)
- Referenced horizontal datum and mapping projection (e.g., NAD 83 State Plane Central)
- Dates of aerial photography and/or topographic information

Similar to what is required for the proposed or as-built plans (see Section 3.3) a signed and stamped seal of a registered professional engineer must be visible on the submitted PDF copies.

In order to use the LOMR data to modify the effective flood hazard data, it is important to know how the data is positioned horizontally and vertically on the surface of the earth. Therefore, the submitted electronic workmap files must use and identify a known horizontal datum (e.g., NAD 83) and mapping projection (e.g., State Plane Central) in

order to orient the workmap's location on the surface of the earth with the location of the effective data. If the mapping utilizes ground coordinates (e.g., Modified State Plane), the conversion factor to grid coordinates (e.g., State Plane Central) or a table showing XY values for several known points in both grid and ground coordinates must be provided.

The data should also use a known vertical datum (e.g., NAVD88) and provide the adjustments to NAVD88 if another vertical datum is used. If the data uses the NGVD29 vertical datum, the conversion factor stated in the effective Flood Insurance Studies (FISs)—whether it's based on a countywide or stream by stream factor—should be used for converting to NAVD88.

Flood hazard information contained in the CAD or GIS workmaps should follow a logical naming and appearance convention, so it is easy to identify the flood hazard features from the geographic or background data. Additionally, a map legend or labels for the pertinent flood hazard information should be included.

Once the review of the case is complete, the District may ask the applicant to provide GIS shape files of the latest hydraulic data (e.g., floodplain delineations, cross-sections, creek centerlines, etc.) shown on the workmaps which reflect any changes that may have developed over the course of the review period.

3.7 Annotated FIRM Panels

Annotated FIRM exhibits are required for all impacted FIRM panels. The annotated FIRM shows the boundaries of the modified floodplains and regulatory floodway within the revised reach and how they tie into the effective information at the upstream and downstream tie-in locations. If an effective LOMR has superseded all or part of the effective information shown on the impacted FIRM panels, the annotated FIRM exhibits should utilize the effective LOMR exhibits as the base information instead of the effective FIRM panel.

3.8 Comparison Tables

BFE comparison tables are required in order to demonstrate the hydraulic model progression and the impacts the proposed project has on the studied drainageway. For a LOMC submittal, comparison tables should be submitted electronically using PDF or Microsoft Excel formats. Appendix C contains a standardized comparison table (a blank version and a completed example are included) which provides a common format for all submittals that will reduce review time. The Excel version of this table is available for download at the Floodplain Management section of the District's web site (see Section 1 for the link). Please note that the values shown in the example version of the Appendix C table are for illustrative purposes only and do not represent actual values used in a LOMC submittal.

Being able to track the progression of the submitted hydraulic models is an important step in understanding how the project affects the existing channel but also how the channel has changed since the original effective analysis was completed. For example, the BFE differences between the Effective and Duplicate Effective models indicate any changes associated with obtaining a copy of the effective model and re-running the model on the user's computer using either an updated version of the hydraulic model used when the effective model was created, or a different hydraulic program (e.g., HEC-2 to HEC-RAS). Another example is the BFE differences between the Pre-Project (Existing or Corrected Effective) model and the Post-Project or Proposed model. These differences isolate the changes in BFE due to the project only and are important in determining if NFIP regulations section 65.12 applies. Additionally, for CLOMR requests, the information presented in the BFE Comparison Table is used directly to write the CLOMR approval letter. FEMA's MT-2 Form Instructions should be consulted when determining which models should be used for each case, as the instructions explain the differences between the various models.

During the preparation of a LOMC submittal, the consultant or requester usually has several hydraulic cross-sections which are not common to all prepared models. For example, there are usually multiple cross-sections used in the proposed conditions model which are not present in the effective or duplicate effective models. Additionally, there might also be cross-sections used in the effective model which do not apply for the proposed conditions model. Finally, when the channel stationing differs between models, comparing common cross-sections can be difficult. In these instances, interpolated values should be used in order to complete the required comparison table. In the case of the Effective BFEs, these values may be obtained by either interpolation or by pulling the BFE value directly from the effective FIS profile at the approximate location. Similarly, existing or proposed elevations can be interpolated at the original effective locations as if an updated profile exists. Finally, since the cross-section identification/label is often different than the stream stationing, a correlation must also be provided in the comparison table information. Please note that interpolated values must be clearly identified on the submitted comparison table in similar fashion to what is shown in Appendix C.

3.9 Annotated FIS Profiles

When a LOMC proposes changes to a flooding source which has an effective Flood Insurance Study (FIS) profile associated with it, an annotated FIS profile exhibit is required. Similar to the annotated FIRM, the exhibits should show the Effective and Proposed or Post-Project elevation profiles, including the revised channel thalweg elevations, within the affected reach and how the revised profile information ties into the effective profiles upstream and downstream of the revised reach. If an effective LOMR has superseded all or part of the effective profile information shown on the impacted FIS profiles, the annotated profile exhibits should utilize the LOMR profiles as the base information instead of the profiles from the effective FIS.

3.10 Annotated Floodway Data Tables

For a submittal which proposes modifications to an effective regulatory floodway, an annotated floodway data table is required. The annotated floodway data table is similar to the annotated FIRM and FIS profiles and indicates which effective FEMA-lettered cross-sections change.

3.11 Agreement Tables

Hydraulic agreement tables or checklists are required for the Proposed or Post-Project models and workmaps in a LOMC submittal. The purpose of these tables is to correlate the information presented by the requester between the hydraulic models and the floodplain workmap. A blank version and an example of a completed agreement table are presented in Appendix D. The Excel version is also available for download on the District's web site.

The table ensures the following information matches between the submitted workmap and hydraulic model:

- Distance between hydraulic cross-sections along channel centerline
- Cumulative channel distance along channel centerline
- 1%-annual-chance floodplain top-width
- Regulatory floodway top-width (if applicable)

In order to complete the table, the requester must first list all hydraulic cross-section locations and corresponding stream stationing on the table. For requests where the number of cross-sections exceeds the available rows, additional pages should be used. Next, the requester must fill in the channel distances according to the hydraulic model for each cross-section. The model channel distances can easily be accessed in HEC-RAS under the Geometry Data window using the "Tables" menu and selecting "Reach Lengths." Next, the Channel Distances for the floodplain workmap can be filled out by measuring the corresponding value for each cross-section. Note the acceptable tolerance listed below of the Channel Distance column as plus or minus 5% of the model channel distance value. This tolerance is checked automatically in the "% Difference" column when using the Excel version of the table. If the Excel version is not used, the "% Difference" will need to be filled in manually. Once the map channel distances are completed, any discrepancies greater than the 5% tolerance, which the Excel version highlights in red, should be corrected or explained in the comments column.

The Cumulative Channel Distance column will automatically fill in as the Channel Distance column is completed. Again, note the tolerance for this item listed below this column (plus or minus 5% of model distance). Any discrepancies exceeding this tolerance should be explained or corrected.

Completing the Base Floodplain Width and Floodway Width columns should be done in much the same way as the Channel Distance column. The floodplain and floodway (if applicable) widths from the hydraulic model should be filled in next to the values measured from the submitted floodplain workmaps. The tolerance for these values is 25 feet. The top-width used is the total section top-width including high ground and/or ineffective flow areas. One way to obtain this value directly from the HEC-RAS hydraulic model is to use the Profile Output Tables—Standard Table 1 or Encroachment Table 3—and modify either one of them to add the three columns necessary to calculate the correct top-width required. Using the Define Table option under the Options menu, the user can add the following variables to the table: “Sta W.S. Rgt”, “Sta W.S. Lft”, and “Diff”. The resulting value presented in the “Diff” column is the correct top-width to report in the Agreement Tables. The FHAD guidelines also contain guidance on reporting floodplain and floodway widths and should be consulted for delineation purposes.

3.12 Other Items

Any other items that are typically included in a LOMC submittal can be included in digital form for a LOMC submittal. This includes but is not limited to:

- Pertinent additional hydraulic and/or hydrologic calculations
- Hydrologic figures such as connectivity diagrams or basin maps
- Copies of previous studies or reports
- Correspondence

3.13 File Structure

The submitted digital files should be organized in a logical fashion using appropriately named documents and folders. Long file names and excessive folder nesting should be avoided whenever possible in order to minimize extraction issues with file paths that are too long.

4. LOMC CHECKLIST

The LOMC Checklist summarizes the various items required for a submittal to the District and was created to assist applicants in ensuring all required items are included with their submittal. A completed Checklist should be filled out by the requester or submitting engineer and included in all LOMC submittals. A blank version of the Checklist is included in Appendix E and the Excel version is available for download on the MHFD web site.

Appendix A

Regulation 65.12 Statement

(DATE)

Ms. Brooke Seymour, P.E., CFM
Engineering Services Manager
Mile High Flood District
2480 West 26th Avenue, Suite 156-B
Denver, CO 80211

RE: (PROJECT NAME/IDENTIFIER)

Dear Ms. Seymour:

With this letter, we hereby certify that no insurable structures are negatively impacted due to the proposed revisions to (FLOODING SOURCE). Please contact us should you have any questions or concerns regarding this certification.

Sincerely,

(COMPANY)

(ENGINEER).

(TITLE)

SAMPLE INSURABLE STRUCTURE STATEMENT
(Meets NFIP Regulation 65.12 Requirements)

Appendix B

Property Owner Notification Statement

(DATE)

Ms. Brooke Seymour, P.E., CFM
Engineering Services Manager
Mile High Flood District
2480 West 26th Avenue, Suite 156-B
Denver, CO 80211

RE: (PROJECT NAME/IDENTIFIER)

Dear Ms. Seymour:

With this letter, we hereby certify that all property owners who are adversely impacted by: any increases in the 1%-annual chance water-surface elevations, increases in and/or shifting of the 1%-annual-chance floodplain, and/or any changes to the boundary of the regulatory floodway when comparing the proposed/post-project and the effective flood hazard conditions for (FLOODING SOURCE) have been individually notified of the changes. In addition, we certify that no insurable structures are negatively impacted due to the revisions. Please contact us should you have any questions or concerns regarding these certifications.

Sincerely,

(COMPANY)

(ENGINEER).

(TITLE)

SAMPLE PROPERTY OWNER NOTIFICATION STATEMENT

(Required for LOMCs with Any Adverse Impacts)

Appendix C

Base Flood Elevation Comparison Table



MHFD LOMC Submittal - BFE Comparison Table - Example

Project Name :	Noname Creek CLOMR
Flooding Source:	Noname Creek
Company:	ICON Engineering, Inc.
Completed By:	Justen Hamann, P.E.

SOURCE DATA											COMPARISONS				
HYDRAULIC CROSS-SECTION INFO.						BASE FLOOD ELEVATIONS (NAVD)									
Effective Cross-Section ID (Letter)	Corrected Effective Cross-Section ID	Corrected Effective Stream Station	Existing Cross-Section ID	Proposed Cross-Section ID	Proposed Stream Station	EFFECTIVE	DUP. EFF.	COR. EFF.	EXISTING	PROPOSED	DUP. EFF vs. EFF.	COR. EFF. vs. EFF.	EX. vs. COR. EFF.	PP. vs. COR. EFF.	PP. vs. EFF.
						BFE	BFE	BFE	BFE	BFE	BFE	BFE	BFE	BFE	BFE
300 (A)	300	300	--	300	300	5205.50	5205.50	5205.50	--	5205.50	0.00	0.00	--	0.00	0.00
--	450	450	--	450	450	5207.10	5207.16	5206.25	--	5206.25	0.06	-0.85	--	0.00	-0.85
605	605	605	--	605	605	5208.10	5208.13	5208.17	--	5208.17	0.03	0.07	--	0.00	0.07
710 (B)	710	710	--	710	710	5208.40	5208.46	5208.80	--	5208.60	0.06	0.40	--	-0.20	0.20
--	900	900	--	900	900	5208.52	5208.52	5209.05	--	5208.70	0.00	0.53	--	-0.35	0.18
--	--	--	--	930	930	5208.60	5208.62	5209.18	--	5209.55	0.02	0.58	--	0.37	0.95
--	--	--	--	1055	1055	5209.94	5209.95	5209.98	--	5210.60	0.01	0.04	--	0.62	0.66
--	--	--	--	1075	1075	5210.12	5210.08	5210.42	--	5210.60	-0.04	0.30	--	0.18	0.48
1010	1166	1166	--	1150	1150	5211.20	5211.12	5211.14	--	5211.36	-0.08	-0.06	--	0.22	0.16
1300	--	--	--	--	--	5212.63	5212.53	5211.80	--	5211.75	-0.10	-0.83	--	-0.05	-0.88
--	1357	1357	--	--	--	5212.68	5212.62	5212.44	--	5212.32	-0.06	-0.24	--	-0.12	-0.36
--	--	--	--	1370	1370	5213.80	5213.78	5213.72	--	5213.67	-0.02	-0.08	--	-0.05	-0.13
1650 (C)	1672	1672	--	1656	1656	5214.57	5214.56	5216.97	--	5216.84	-0.01	2.40	--	-0.13	2.27
--	--	--	--	1840	1840	5217.21	5217.21	5218.66	--	5218.96	0.00	1.45	--	0.30	1.75
--	--	--	--	2050	2050	5219.30	5219.30	5220.63	--	5220.31	0.00	1.33	--	-0.32	1.01
2115	2136	2136	--	2120	2120	5220.30	5220.30	5221.27	--	5223.68	0.00	0.97	--	2.41	3.38
--	--	--	--	2227	2227	5222.56	5222.64	5222.41	--	5225.20	0.08	-0.15	--	2.79	2.64
2371	--	--	--	--	--	5224.60	5224.71	5224.62	--	5227.53	0.11	0.02	--	2.91	2.93
--	--	--	--	2302	2302	5225.34	5225.34	5226.20	--	5228.63	0.00	0.86	--	2.43	3.29
--	--	--	--	2327	2327	5225.98	5225.99	5227.71	--	5229.87	0.01	1.73	--	2.16	3.89
--	--	--	--	2370	2370	5227.46	5227.46	5228.43	--	5230.37	0.00	0.97	--	1.94	2.91
--	--	--	--	2390	2390	5232.47	5232.46	5232.88	--	5234.48	-0.01	0.41	--	1.60	2.01
--	--	--	--	2460	2460	5234.54	5234.54	5233.12	--	5234.65	0.00	-1.42	--	1.53	0.11
--	2545	2545	--	--	--	5236.20	5236.20	5233.46	--	5234.90	0.00	-2.74	--	1.44	-1.30
2705 (D)	2745	2745	--	2701	2701	5237.48	5237.48	5237.20	--	5236.50	0.00	-0.28	--	-0.70	-0.98
--	2989	2989	--	2945	2945	5239.40	5239.40	5238.77	--	5238.74	0.00	-0.63	--	-0.03	-0.66
3130	3170	3170	--	3126	3126	5240.80	5240.80	5240.16	--	5240.16	0.00	-0.64	--	0.00	-0.64
--	3422	3422	--	3378	3378	5245.20	5245.20	5244.62	--	5244.62	0.00	-0.58	--	0.00	-0.58
3580 (E)	3620	3620	--	3576	3576	5248.42	5248.44	5248.13	--	5248.13	0.02	-0.29	--	0.00	-0.29

-- = Not applicable or no direct comparison available
5225.98 = Interpolated value or value pulled directly from the effective FIS profile



MHFD LOMC Submittal - BFE Comparison Table

Project Name :	
Flooding Source:	
Company:	
Completed By:	

SOURCE DATA											COMPARISONS				
HYDRAULIC CROSS-SECTION INFO.						BASE FLOOD ELEVATIONS (NAVD)									
Effective Cross-Section ID (Letter)	Corrected Effective Cross-Section ID	Corrected Effective Stream Station	Existing Cross-Section ID	Proposed Cross-Section ID	Proposed Stream Station	EFFECTIVE	DUP. EFF.	COR. EFF.	EXISTING	PROPOSED	DUP. EFF vs. EFF.	COR. EFF. vs. EFF.	EX. vs. COR. EFF.	PP. vs. COR. EFF.	PP. vs. EFF.
						BFE	BFE	BFE	BFE	BFE	BFE	BFE	BFE	BFE	
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00
											0.00	0.00	0.00	0.00	0.00

-- = Not applicable or no direct comparison available
5225.98 = Interpolated value or value pulled directly from the effective FIS profile

Appendix D

Hydraulic Agreement Table



MHFD LOMC Submittal - Agreement Table - Example

PROJECT NAME: Todd Creek CLOMR

COMPANY: ICON Engineering, Inc.

COMPLETED BY: Justen Hamann, P.E.

Community(ies):
Flooding Source(s):

City of Thornton & Adams County, CO

Todd Creek

Page: 1 of 1

Date: 3/18/2021

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Todd Creek, D/S Tie-In Location	480.2	480	15	15	0%	15	15	0%	25	25	0	25	25	0	
	490.4	490	50	51	2%	65	66	2%	62	60	2	55	60	5	
	500.1	500	780	782	0%	845	848	0%	75	80	5	60	60	0	
	510.0	510	710	718	1%	1555	1566	1%	87	85	2	68	60	8	
	520.2	520	370	360	3%	1925	1926	0%	135	130	5	85	80	5	
	530.3	530	435	430	1%	2360	2356	0%	120	125	5	80	80	0	
	539.9	540	575	580	1%	2935	2936	0%	99	100	1	80	80	0	
D/S XS - Yosemite St. Bridge	550.0	550	460	450	2%	3395	3386	0%	112	110	2	55	60	5	
U/S XS - Yosemite St. Bridge	550.8	551	73	72	1%	3468	3458	0%	162	190	28	100	100	0	Island not plotted on workmap
	560.1	560	45	44	2%	3513	3502	0%	132	130	2	132	130	2	
	569.6	570	87	90	3%	3600	3592	0%	116	120	4	116	120	4	
	570.5	571	61	60	2%	3661	3652	0%	114	110	4	114	110	4	
	580.3	580	323	327	1%	3984	3979	0%	87	90	3	87	90	3	
	590.0	590	432	435	1%	4416	4414	0%	83	80	3	78	80	2	
U/S XS - Pedestrian Bridge	590.7	591	157	161	3%	4573	4575	0%	66	70	4	66	70	4	
D/S XS - Pedestrian Bridge	591.5	591.5	35	35	0%	4608	4610	0%	88	80	8	80	80	0	
	592.4	592	20	20	0%	4628	4630	0%	90	95	5	80	80	0	
	600.1	600	78	80	3%	4706	4710	0%	81	80	1	81	80	1	
	629.6	630	118	120	2%	4824	4830	0%	70	70	0	70	70	0	
	645.4	645	95	92	3%	4919	4922	0%	72	75	3	72	75	3	
Todd Creek, U/S Tie-In Location	700.0	700	290	291	0%	5209	5213	0%	80	80	0	80	80	0	
ACCEPTABLE TOLERANCES =			+/- 5% of Model			+/- 5% of Model			+/- 25 Feet						



MHFD LOMC Submittal - Agreement Table

PROJECT NAME:
COMPANY:
COMPLETED BY:

Community(ies): _____
Flooding Source(s): _____

Page: 1 **of** 1
Date: 3/18/2010

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
					#DIV/0!	0	0	#DIV/0!			0			0	
ACCEPTABLE TOLERANCES =			+/- 5% of Model			+/- 5% of Model			+/- 25 Feet						

Appendix E

LOMC Checklist



MHFD LOMC CHECKLIST

PROJECT NAME:

COMPANY:

COMPLETED BY:

LOMC Submittal Item		Included?
Item No.	Item	
2	Review Fees	
3.1	Report Text	
3.2.a	Hydraulic and/or Hydrologic Models	
3.2.b	Hydraulic and/or Hydrologic Reports and Cross-Sections	
3.3	Proposed Construction Plans, As-Built Plans, and Survey Information	
3.4	FEMA MT-2 Forms	
3.5.1	Meets Tie-in Requirements	
3.5.2	CLOMR ESA Compliance	
3.5.3	Section 65.12 Requirements	
3.5.4	Draft BFE and SFHA Property Owner Notifications	
3.5.5	Floodway Revision Notifications	
3.6	Floodplain Workmaps (PDF and Digital Source Files)	
3.7	Annotated FIRM Panels	
3.8	Comparison Tables	
3.9	Annotated FIS Profile	
3.10	Annotated Floodway Data Table	
3.11	Agreement Tables	
3.12	Other Items	