

# **Juan Tabo Hills Estates**

## **Request for CLOMR**

**Volume 3 of 4**

### **Prepared For:**

**Juan Tabo Hills West LLC**

**P.O. Box 9470**

**Albuquerque, NM 87119**

**(505) 899-6768**

### **Prepared By:**

**Mark Goodwin & Associates, PA**

**PO BOX 90606**

**Albuquerque, NM 87199**

**(505) 828-2200**

## PURPOSE & SCOPE

Juan Tabo Hills West, LLC, the owner of Tract 'A' of the Juan Tabo Hills West Plat wishes to proceed with construction of the first phase of Juan Tabo Hills Estates, a planned 350 lot, single family residential, 85.1059 acre development including construction of bank protection along the south side of the Tijeras Arroyo between Kirtland Air force Base and the South Eubank Landfill. To that end JTHW, LLC hired Mark Goodwin and Associates, PA, MGA, to provide drainage engineering design and analysis for the proposed subdivision and this report is the third of four reports being prepared for that purpose.

The *Onsite Drainage Analysis Report*, Volume 1 of 4, provides detailed hydraulic analysis of onsite surface drainage in the streets, inlet design, and preliminary sizing of the on-site storm sewers. It also includes hydrology analysis of the 300 acre upstream urban watershed ( $Q_{100}=924.20$  cfs), final grading plans for the lots, and design of an onsite 3.08 ac-ft Storm Water Quality, SWQ, pond in the southwest corner of the development.

The *Bank Protection Design Analysis Report*, Volume 2 of 4, includes sediment transport analysis to determine the vertical stability of the Tijeras and scour calculations to determine the depth of the bank protection below the bed of the arroyo.

This *Request for Conditional Letter of Map Revision*, CLOMR, Volume 3 of 4, contains detailed hydraulic analysis of the Tijeras Arroyo, an annotated Flood Insurance Rate Map, FIRM, and a copy of the Bank Protection Profile which serves as the topo work map. It also includes applicable Federal Emergency Management Administration, FEMA, MT-2 application Forms.

The *404 Individual Permit* application, Volume 4 of 4, includes an Approved Jurisdictional Determination, AJD, Alternatives Analysis, and a Conceptual Mitigation Plan, and USACE Individual Permit application forms along with other required attachments.

## DESIGN CONSIDERATIONS

The bank protection is proposed to be located as close to the arroyo as possible without placing any fill in the newly defined floodway per LOMR Case No. 13-06-1053P, effective June 17, 2013 (see Annotated FIRM and previous LOMR), and without placing any of the shotcrete scour protection in Jurisdictional Waters of the US (see Topo Work Map/ Profile), not even below grade. This project will just be filling in a shallow overbank area currently mapped as Zones A0, Shaded Zone X, and a small portion of Zone AE. The main channel will be widened, channelized, thus reducing the water surface elevations rather than raising them (see Cross Sections).

The "Revised HEC-RAS" model includes the analysis of a future 500 year design flow, 35,853 cfs, and the top of the fill is set above this future design elevation, but the future flow rate and associated elevations are not used for mapping any FEMA floodplains. The top of fill is above:

1. The future 500 year water surface elevation,
2. The existing 500 year water surface elevation, and
3. The 100 year water surface elevation plus 2' freeboard plus superelevation per City of Albuquerque Development Process Manual.

## Project Location

The project is located in southeast Albuquerque New Mexico one half (1/2) mile west of Juan Tabo Hills Blvd. and two (2) miles south of Central Ave (lat 35.046° North, long 106.522° West). Legal description is Tract 'A' of Juan Tabo Hills West an 85.1059 acre tract located in the southwest quarter of section 33 Township 10 North, Range 4 East NMPM and is bounded on the south by Kirtland Air Force Base, on the west and north by the Tijeras Arroyo, and on the East by Juan Tabo Hills Subdivision Units 1 and 2.



U.S. DEPARTMENT OF HOMELAND SECURITY  
FEDERAL EMERGENCY MANAGEMENT AGENCY  
**OVERVIEW & CONCURRENCE FORM**

O.M.B No. 1660-0016  
Expires February 28, 2014

**PAPERWORK BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

**PRIVACY ACT STATEMENT**

**AUTHORITY:** The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

**PRINCIPAL PURPOSE(S):** This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

**ROUTINE USE(S):** The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

**DISCLOSURE:** The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

**A. REQUESTED RESPONSE FROM DHS-FEMA**

This request is for a (check one):

- ☒ **CLOMR:** A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).
- ☐ **LOMR:** A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

**B. OVERVIEW**

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301	City of Katy	TX	48473C	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
50002	City of Albuquerque	NM	35001C	0367G	9/26/08

2. a. Flooding Source: Tijeras Arroyo

- b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
- ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Juan Tabo Hills West Estates

4. FEMA zone designations affected: AO, AE, Shaded X (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

- ☒ Physical Change ☐ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
- ☐ Coastal Analysis ☐ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
- ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
- ☐ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures:

☒ Channelization

☐ Levee/Floodwall

☐ Bridge/Culvert

☐ Dam

☒ Fill

☐ Other (Attach Description)

6. ☐ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

### C. REVIEW FEE

Has the review fee for the appropriate request category been included?

☒ Yes

Fee amount: \$4,400.00

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at [http://www.fema.gov/plan/prevent/fhm/fm\\_fees.shtm](http://www.fema.gov/plan/prevent/fhm/fm_fees.shtm) for Fee Amounts and Exemptions.

### D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: James D. Hughes

Company: Mark Goodwin & Associates, PA

Mailing Address:  
PO BOX 90606

Daytime Telephone No.: (505) 828-2200

Fax No.: (505) 797-9539

Albuquerque, NM 87199

E-Mail Address: [doug@goodwinengineers.com](mailto:doug@goodwinengineers.com)

Signature of Requester (required):

Date:

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Curtis Cheme

Community Name: City of Albuquerque

Mailing Address:  
PO BOX 1293

Daytime Telephone No.: (505) 924-3695

Fax No.: (505) 924-3864

Albuquerque

E-Mail Address: [ccheme@cabq.gov](mailto:ccheme@cabq.gov)

Community Official's Signature (required):

Date:

### CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: James D. Hughes

License No.: 11674

Expiration Date: 12-31-2014

Company Name: Mark Goodwin & Associates, PA

Telephone No.: (505) 828-2200

Fax No.: (505) 797-9539

Signature:

Date:

E-Mail Address: [doug@goodwinengineers.com](mailto:doug@goodwinengineers.com)

Ensure the forms that are appropriate to your revision request are included in your submittal.

**Form Name and (Number)**

**Required if ...**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Riverine Hydrology and Hydraulics Form (Form 2) | New or revised discharges or water-surface elevations  |
| <input checked="" type="checkbox"/> Riverine Structures Form (Form 3)               | Channel is modified, addition/revision of bridge/culverts,<br>addition/revision of levee/floodwall, addition/revision of dam |
| <input type="checkbox"/> Coastal Analysis Form (Form 4)                             | New or revised coastal elevations  |
| <input type="checkbox"/> Coastal Structures Form (Form 5)                           | Addition/revision of coastal structure   |
| <input type="checkbox"/> Alluvial Fan Flooding Form (Form 6)                        | Flood control measures on alluvial fans  |

Seal (Optional)



U.S. DEPARTMENT OF HOMELAND SECURITY  
FEDERAL EMERGENCY MANAGEMENT AGENCY  
**RIVERINE HYDROLOGY & HYDRAULICS FORM**

O.M.B No. 1660-0016  
Expires February 28, 2014

**PAPERWORK BURDEN DISCLOSURE NOTICE**

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

**PRIVACY ACT STATEMENT**

**AUTHORITY:** The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

**PRINCIPAL PURPOSE(S):** This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

**ROUTINE USE(S):** The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

**DISCLOSURE:** The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Tijeras Arroyo

Note: Fill out one form for each flooding source studied

**A. HYDROLOGY**

**1. Reason for New Hydrologic Analysis (check all that apply)**

- |   |  |  |
|---|--|--|
| <input checked="" type="checkbox"/> Not revised (skip to section B) | <input type="checkbox"/> No existing analysis        | <input type="checkbox"/> Improved data                           |
| <input type="checkbox"/> Alternative methodology                    | <input type="checkbox"/> Proposed Conditions (CLOMR) | <input type="checkbox"/> Changed physical condition of watershed |

**2. Comparison of Representative 1%-Annual-Chance Discharges**

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
----------	-------------------------	---------------------	---------------

**3. Methodology for New Hydrologic Analysis (check all that apply)**

- |   |  |
|---|--|
| <input type="checkbox"/> Statistical Analysis of Gage Records | <input type="checkbox"/> Precipitation/Runoff Model → Specify Model: _____ |
| <input type="checkbox"/> Regional Regression Equations        | <input type="checkbox"/> Other (please attach description)                 |

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

**4. Review/Approval of Analysis**

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

**5. Impacts of Sediment Transport on Hydrology**

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

## B. HYDRAULICS

### 1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit*	<u>Limits of Detailed Study</u>	<u>2.9</u>	<u>5381.9</u>	<u>5386.01</u>
Upstream Limit*	<u>AQ</u>	<u>20</u>	<u>5440.8</u>	<u>5437.66</u>

\*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

### 2. Hydraulic Method/Model Used: HEC-RAS 4.1.0

### 3. Pre-Submittal Review of Hydraulic Models\*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

### 4.

<u>Models Submitted</u>	<u>Natural Run</u>		<u>Floodway Run</u>		<u>Datum</u>
Duplicate Effective Model*	File Name: <u>JTHE CLOMR</u>	Plan Name: <u>Floodplain Effective</u>	File Name: <u>_2013067_</u>	Plan Name:	<u>1929</u>
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name: <u>JTHE CLOMR</u>	Plan Name: <u>AMAFCA Floodplain</u>	File Name: <u>Revised 2013-12-30</u>	Plan Name:	<u>1929</u>
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

\* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

## C. MAPPING REQUIREMENTS

A certified topographic work map must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: PDF Plated by ACAD

Source: Aldrich Land Surveying, Inc.

Date: \_\_\_\_\_

Accuracy: ±0.1

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach a copy of the effective FIRM and/or FBFM, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

☒ Annotated FIRM and/or FBFM (Required)



#### D. COMMON REGULATORY REQUIREMENTS\*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No
- a. For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
  - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.
- b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☐ Yes ☒ No  
If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.
2. Does the request involve the placement or proposed placement of fill? ☒ Yes ☐ No
- If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.
3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No
- If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)
4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

DEPARTMENT OF HOMELAND SECURITY  
FEDERAL EMERGENCY MANAGEMENT AGENCY  
**RIVERINE STRUCTURES FORM**

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Flooding Source: Tijeras Arroyo

Note: Fill out one form for each flooding source studied.

**A. GENERAL**

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B  
Bridge/Culvert.....complete Section C  
Dam.....complete Section D  
Levee/Floodwall.....complete Section E  
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Excavate/Widen Channel & Fill Overbank

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: South bank of the Tijeras Arroyo between Eubank Landfill. and Kirtland AFB

Downstream Limit/Cross Section: 2.9

Upstream Limit/Cross Section: 20 (AQ)

2. Name of Structure: \_\_\_\_\_

Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: \_\_\_\_\_

Downstream Limit/Cross Section: \_\_\_\_\_

Upstream Limit/Cross Section: \_\_\_\_\_

3. Name of Structure: \_\_\_\_\_

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: \_\_\_\_\_

Downstream Limit/Cross Section: \_\_\_\_\_

Upstream Limit/Cross Section: \_\_\_\_\_

**NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.**

**B. CHANNELIZATION**Flooding Source: Tijeras ArroyoName of Structure: Fill Encroachment1. Hydraulic ConsiderationsThe channel was designed to carry 30,500 (cfs) and/or the 500-year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow      ☐ Critical flow      ☐ Supercritical flow      ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel    ☐ Outlet of channel    ☐ At Drop Structures    ☐ At Transitions☐ Other locations (specify): \_\_\_\_\_2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)]    ☐ Drop structures    ☒ Superelevated sections  
☐ Transitions in cross sectional geometry    ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)]    ☐ Energy dissipator  
☐ Weir    ☐ Other (Describe): \_\_\_\_\_4. Sediment Transport ConsiderationsAre the hydraulics of the channel affected by sediment transport?    ☐ Yes    ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

**C. BRIDGE/CULVERT**

Flooding Source: \_\_\_\_\_

Name of Structure: \_\_\_\_\_

## 1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS  
☐ Modified bridge/culvert previously modeled in the FIS  
☐ Revised analysis of bridge/culvert previously modeled in the FIS

## 2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): \_\_\_\_\_

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

## 3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

<input type="checkbox"/> Dimensions (height, width, span, radius, length)	<input type="checkbox"/> Distances Between Cross Sections
<input type="checkbox"/> Shape (culverts only)	<input type="checkbox"/> Erosion Protection
<input type="checkbox"/> Material	<input type="checkbox"/> Low Chord Elevations – Upstream and Downstream
<input type="checkbox"/> Beveling or Rounding	<input type="checkbox"/> Top of Road Elevations – Upstream and Downstream
<input type="checkbox"/> Wing Wall Angle	<input type="checkbox"/> Structure Invert Elevations – Upstream and Downstream
<input type="checkbox"/> Skew Angle	<input type="checkbox"/> Stream Invert Elevations – Upstream and Downstream
	<input type="checkbox"/> Cross-Section Locations

4. Sediment Transport ConsiderationsAre the hydraulics of the structure affected by sediment transport?    ☐ Yes    ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.