**A hydraulic report should accompany this form for natural streams with Q50 of 500cfs or more and canals.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Key Number | Project Number | | | Station | | Date |
|  |  | | |  | |  |
| Project Title | | | Local Name | | | |
|  | | |  | | | |
| Location | | | | | County | |
|  | | | | |  | |
| Roadway Identification | | | | | | |
|  | | | | | | |
| Crossing | | A Tributary Of | | | | |
| Creek  River  Canal | |  | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Hydrologic Data** | | | | |
| Hydrology Methods Used to Determine Design Flows | | | | |
| USGS Website  Flood Insurance Study  USGS Regression Equations | | | | |
| Other (Describe) |  | | | |
| Description of Watershed | | | | |
|  | | | | |
| Drainage Basin Area  mi2  acres | | Community Name | | |
|  | |  | | |
| Flood Insurance Rate Map (FIRM) Panel Number\* | | | Regulatory Floodway | If Yes, Floodway Map Panel Number\* |
|  | | | Yes  No |  |

\*Attach 8 1/2" x 11" copy of map panel at the structure location.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Stream Data** | | | | | | | |
| Natural Stream  Canal | Months Dry, If Any | | | Streambed Elevation of Structure | | | Streambed Slope |
|  | | |  | | | ft |
| Stream Carries an Appreciable Amount of Ice | | | Ice Thickness | | | Stream Carries an Appreciable Amount of Driftwood | |
| Yes  No | | | in | | | Yes  No | |
| Character of Streambed | | | | | Describe Streambed | | |
| Stable  Agrading  Degrading  Headcutting | | | | |  | | |
| Flow Controlled | | If Controlled, Explain | | | | | |
| Upstream  Downstream | |  | | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Existing Structure** | | | | | | | |
| Bridge  Culvert (Describe the Bridge or Culvert) | | | | | | | |
|  | | | | | | | |
| General Condition | | | | | | | Year Constructed |
|  | | | | | | |  |
| Describe Any Existing Adverse Conditions | | | | | | | |
|  | | | | | | | |
| Type of Bridge Piers | Number of Piers | | | Bridge or Culvert Type | | Structure Dimensions, Diameter, Etc. | |
| Spread Footings  Piles |  | | |  | |  | |
| Total Bridge Opening Area Normal to Channel | | | Bridge Clearance Above Q50 High Water | | Velocity Through Structure | | |
| ft2 | | | ft | | fps | | |
| Existing Culvert Carried Flow Adequately | | If No, Explain | | | | | |
| Yes  No | |  | | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Design Flow Data** | | | |
| **Flood** | **Discharge** | **Water Surface Elevation** | **Velocity** |
| Design [Q]\* | cfs | ft | fps |
| Base [Q100] | cfs | ft | fps |
| Scour [Q500] | cfs | ft | fps |
| Canal Flow | cfs | ft | fps |

\*Use Q50 for bridges and culverts 12 ft or more in width/diameter and for open bottom culverts. Use Q25 for all other culverts.

|  |  |  |
| --- | --- | --- |
| **Proposed Bridge** | | |
| Type | Ordinary High Water Elevation | Number and Length of Spans |
|  | ft |  |
| Skew Angle | Calculated Riprap Size, D50 | Bottom of Girder Elevation |
| ° | ft | ft |
| Flow Angle to Pier | Calculated Contraction Scour Depth | Q50 Water Surface Elevation |
| ° | ft | ft |
| Streambed Material Size, D50 | Calculated Pier Scour Depth | Q50 Freeboard |
| mm | ft | ft |

|  |  |  |  |
| --- | --- | --- | --- |
| **Proposed Culvert** | | | |
| Type | | Dimensions | Inlet Type |
|  | |  |  |
| Culvert Flowing Under | | Invert Inlet Elevation | Outlet Elevation |
| Inlet Control  Outlet Control | | ft | ft |
| Outlet Protection Required | | Tailwater Elevation | Bottom of Gravel Course Elevation |
| No  Yes | | ft | ft |
| Channel Change | | Tailwater Depth | Calculated Headwater Elevation (HW) |
| No  Yes | | ft | ft |
| Energy Dissipater (If Yes, Describe) | | Culvert Slope | Bottom of Gravel Course Freeboard |
| No  Yes |  | ft | ft |
| Riprap Required (If Yes, D50) | | Finished Grade Elevation Centerline Roadway | HW/D Ratio |
| No  Yes       ft | |  |  |
| Proposed Culvert Will Carry the Base Flood (Q100) Without Overtopping the Roadway | | | |
| No  Yes | | | |

|  |  |
| --- | --- |
| **In addition to the above information, submit and check each of the following that apply.** | |
|  | A typical proposed roadway section at the structure. |
|  | A 11" x 17" contour map of the structure site showing 1 foot contours. |
|  | A centerline profile to the same scale as the contour map. |
|  | A vicinity map, such as a county map, with the location of the structure clearly indicated. |
|  | A streambed profile 500 to 1,000 feet above and below the structure. |
|  | Riprap details (typical section, limits, size, toe embedment, etc.) for proposed locations. |
|  | Photographs of the existing structure and channel upstream and downstream from the site. |
|  | Channel change or canal lining details (typical section, plan and profile, and limits). |
|  | Computations for scour based on Q500 or canal flow. (Attach HEC-RAS contraction scour and if applicable, pier scour report.) |
|  | Hydraulic report. (See Design Manual for format.) |
|  | Letter of approval from canal company or irrigation district. |
|  | Floodplain Development Permit from the city/county if the structure is located in the 100-year floodplain. |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Remarks/Sketches (Dimensions in Feet) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | | |  | | | |  | | |  | | |  |  | | |  | | |  | | | |  | | |  |
|  |  | | |  | | | |  | | |  | | |  |  | | |  | | |  | | | |  | | |  |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  |  | Elev. |  |  |  | Elev. |  | |  |  | |  |  |  |  | |  |  | | Elev. |  |  |  | Elev. |  |  |  |
|  |  |  |  |  |  |  |  |  | |  |  | |  |  |  |  | |  |  | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  | |  | Elev. |  | |  |  |  |  | | Elev. |  |  | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  | |  |  | |  |  |  |  | |  |  | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  | |  | |  | Elev. |  | Elev. |  |  | |  | |  |  |  |  |  |  |  |  |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Channel Cross Section at Upstream Face of Proposed Bridge (From HEC-RAS) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| Prepared By | Title | | Engineer’s Signature and Seal |
|  |  | |  |
| Accepted by LHTAC Administrator, Bridge Engineer, or District Engineer | | Signature/Date | |
|  | |  | |