Hydraulic Design Data Checklist

This is a summary for design and review of a road / stream crossing using the hydraulic design approach for fish passage at culverts. Data is summarized to show design milestones, assumptions, and conclusions. This is not likely all of the data required for a complete design. Other design data sheets are available for other design methods.

A plan view sketch and a long profile should be attached to this design data form. See the design guide for background for all data and details recommended on sketches.

Describe any additional details necessary for the design on additional sheets.

Project

Project name and ID		
Stream		
Road, location		
Lat / Long (d/m/s)		
Interdisciplinary Design Team members		
Date		

Brief description of project _____
_____
_____

Project type (new, retrofit, replacement) _____

Does this design satisfy hydraulic design approach criteria? If not, explain deviations and

limitations. Y / N _____

_____

Site characteristics

Is there an existing culvert(s)?   Y / N

Is existing culvert perched?   Y / N   Height of perch_____

Is downstream channel incised?   Y / N   Depth of incision_____

Evidence of incision _____

_____

Upstream backwater deposition   Y / N

Evidence and extent _____

_____

Project _____   Project ID _____
                                  Date _____

2 – BASIS OF DESIGN

Target Species

Species	Age class (Juv, Adult)	Fish length (in)	Hydraulic criteria		
			Max velocity (fps)	Min depth (ft)	Max turbulence (ft-lb/s/cuft)

Describe data sources _____
_____

Hydrology

Watershed characteristics

Area _____ sq miles   Mean elevation ft _____ above sea level

Mean annual precipitation _____ inches

Other hydrologic or flow characteristics (hydrologic province, area of lakes, northing, etc.)

_____
_____

Peak design flows	Derived flow (cfs)	Standard error (%)	Design flow (cfs)
2 - yr flow			
10 - yr flow			
25 - yr flow			
100 - yr flow			

Fish passage design flows

Species	Age class	Movement seasons (months)	High design flow (cfs)	Low design flow (cfs)

Describe how hydrology was calculated and any assumptions (e.g., future conditions) made.

_____
_____

Project _____   Project ID _____
                                  Date _____

3 – DESIGN

Channel

	Downstream	Upstream
Average slope	%	%
Average bankfull width	ft	ft
Bed Elevation - project profile		
Bed Elevation - low potential profile		
Bed Elevation - high potential profile		
Channel type (M&B classification)		
Channel roughness (n)		
Elevation of downstream control		

How is profile controlled? _____

_____

Culvert Description
Dimensions, Elevations

	Existing Culvert	Proposed Culvert
Span	ft	
Rise	ft	ft
Upstream Invert Elevation		
Downstream Invert Elevation		
Culvert Length	ft	ft
Slope	%	%

Note: for bottomless structures, report elevations of tops of footings.

Description of proposed culvert; Chose one or more in each line

Shape:　　　Round　　　-　　　Arch　-　　　Box

_____

Material:　　Corrugated metal　　-　　Smooth metal　　-　　Concrete

Corrugation dimensions: _____

Style:　　　Full pipe　　-　　Bottomless

Project _____   Project ID _____
                                                Date _____

4 - DESIGN

Fish Passage Hydraulics

Flow (cfs)	Tailwater elev	Roughness (n)	Velocity (fps)	Depth (ft)	EDF (ft-lb/sec/cuft)	Passability (%)

Describe roughness (corrugation dimensions, bed material or roughened channel description, baffle geometry, etc.)

_____

_____

Describe methods and sources of data for fish passage hydraulic calculations.

_____

_____

High flow hydraulics

Event	Flow (cfs)	Tailwater elevation	Roughness (n)	Water surface elevation upstream	Headwater (HW/culvert rise)
2 - yr flow					
10 - yr flow					
25 - yr flow					
100 - yr flow					

Describe methods and sources of data high flow hydraulic calculations. _____

_____

Road and Alignment

Height of fill on upstream face: _____ft.

Proposed culvert skew (parallel is 0 degrees)

Culvert to channel _____ degrees   Road to culvert   _____ degrees

Proposed alignment, transition changes

_____

_____

Describe permanent benchmark and elevation _____

_____