PRELIMINARY REPORT REQUIREMENTS

One pdf shall be submitted for review. Following a review of the preliminary report, ODOT will send the consultant any comments or requested revisions. When responding to a list of comments please copy and address each item individually. Once comments have been addressed or agreed upon and ODOT has received any requested revised material; ODOT will schedule a hydraulic conference with the consultant, Mr. Jason Giebler; Bridge Engineer, Mrs. Kacie Braddy; Hydraulic Engineer, the Project Manager, EM from roadway and EM from bridge. Following hydraulic conference the consultant will submit any revisions requested at the conference then attend the right of way (ROW) meeting if deemed necessary. Once the (ROW) meeting minutes report has been finalized and all revisions from field review have been made, ODOT will request from the consultant a final copy of hydraulic report with all revisions and changes incorporated, and any permit applications.
The report format should include the following:

Title Page
Bridge Hydraulic Data Summary Sheet
Comparison Table
Table of Contents
I. Introduction
II. General
III. Design Flows/ Hydrology
IV. Hydraulic Analysis
V. Existing Bridge
VI. Proposed Bridge/ Detour
VII. Scour
VIII. Risk Statement

Appendix A – Scope, Photos

Appendix B – Hydrology -Drainage maps

Appendix C – Hydraulic Model – Natural Stream

Appendix D – Hydraulic Model –Existing Bridge

Appendix E– Hydraulic Model – Proposed Bridge

Appendix F– Hydraulic Model – Detour Bridge (not necessary for all projects)

Appendix G - Scour (not necessary for all projects)

Appendix H – Hydraulic P & P, Bridge Layout, or RCB Flowline profile

Each section should contain the following:

Title Page Include County, Project number, State Job Piece number, highway, creek name, bridge NBIS #, risk statement. Must be PE Sealed, signed and dated.

Bridge Hydraulic Data Summary Sheet

Use the appropriate Bridge summary, multiple opening summary or RCB summary that is current on the ODOT website. This document must be completed as instructed and signed, sealed and dated.

Comparison Table

Use the appropriate Bridge comparison table or RCB comparison table that is current on the ODOT website. This document must be completed as instructed.

Table of Contents

I. Introduction. In this section please include the scope of project, location and description. Discuss if location is in a FEMA Flood Zone or controlled by NRCS structures. Include a legal description of the project location. Include a site map and a vicinity map.

II. General In this section please discuss stream characteristics including channel meanders, debris carried, potential for degradation, etc. and state how this will affect the design. Discuss watershed characteristics and any anticipated changes. Discuss photos taken during field visit and provide in appendix. Discuss any up or downstream controls.

III. Design Flows/ Hydrology In this section please provide the design storm for this project. (i.e.: interstate highway; principal arterial - 2% or 50 yr storm) Refer to Design Storm Selection Guidelines. Provide hydrologic methods used and why chosen. List all variables needed and/ or used for that method i.e.: computed drainage area, slope and annual precipitation. List the computed discharge for 2, 5, 10, 25, 50, 100, & 500 year frequency. Discuss any historic flooding, high-water marks, and overtopping frequency. Provide copy of any Gage, FEMA or NRCS Data used in computations. The computations and the delineated drainage area map should be located in the appendix. Check the USGS Flood database for overtopping frequencies.

IV. Hydraulic Analysis In this section please include the method used and the version of the application (i.e.: HEC RAS 5.0.3). Discuss the development of the hydraulic models of the natural unconstricted channel, the existing structures and roadway, and the proposed structure(s) and roadway. Include values used as boundary conditions, Mannings "n" values and why chosen. What flow regime was used and why. Please provide a copy of any FEMA flood data used or referred to in appendix.

V. Existing Bridge In this section please provide information about the existing bridge [size, type, condition, age, performance, skew, etc.]. Include any history from inspection reports that could affect the design such as degradation, scour rating, RCB cells silted in, frequent overtopping, high-water marks from inspections or flood information sheets. Include information about the existing roadway relevant to design [i.e. width, sight restrictions, grade issues, drives, or utilities]. Determine overtopping frequency from the model and verify with field data, or field division personnel. Check USGS flood database for calibration of existing model. Provide the overtopping frequency, elevation and location (station(s)).

VI. Proposed Bridge In this section please describe the proposed structure and how it performs. What is the overtopping frequency? Is it within the suggested guidelines for design storm? Does the recommended bridge agree with the scope? Why was this size, skew, and type chosen? What other bridge sizes, arrangements, or grades were tried and why didn't they work. Discuss the benefits of arrangements chosen and the alternatives not chosen.

Determine overtopping frequency from the model and provide the overtopping frequency, elevation and location (station(s)).

In this section please include a comparison table of the natural, existing and proposed conditions [water surface elevations from upstream section (outside of contraction reach) and velocities from downstream face of bridge or outlet of RCB]. Include the computed backwater for the existing and proposed models and the computed overtopping elevations and frequencies for BOTH models.

***Also include a plot stage-discharge curve with natural open, existing, and proposed conditions.

THIS IS A FEDERAL REQUIREMENT**

If required, provide information regarding the detour run. Include the location (station offset distance and direction), structure description including number, diameter, inlet elevation, and slope of detour pipes. Provide summary with detour overtopping frequency discharge, velocity, and computed high-water elevation. The overtopping frequency is recommended as the Q-2 except in cases where a higher frequency can be justified by risk. Do not size pipe to pass Q-2, the detour should overtop at about a 2 year storm. (i.e.: speed limit and sight distance).

VII. Scour Scour must be computed and provided for all multi-span structures (Scour computations are not required for RCB or single span bridge structures). Discuss variables and method used in your scour computations. Give the resulting scour depths for pier, contraction and total scour depths. These must also be included in the summary sheet. Scour depths should be computed for the 100 year frequency and ***EITHER*** the overtopping ***OR*** 500 year, whichever occurs first.

VIII. Risk Statement In this section please discuss potential risk to human life due to flooding based on the proposed structure and roadway fill**.** This section of the report and summary sheet should include this statement:
Hydraulic Design is in compliance with "Federal-Aid Policy Guide 23 CFR 650, Subpart A"

Appendix A – Scoping Report, Labeled Photos,

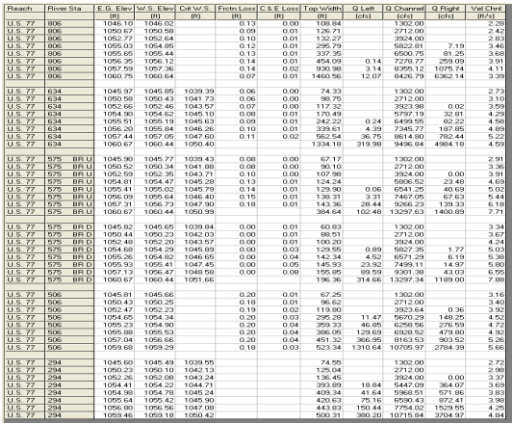
Appendix B - Hydrology - Delineated Drainage area map, Hydrologic Computations, Gage Data, SCS data, Firmette, any FEMA FIS Data used. USGS Flood Database Results, including flood information forms. Include a screenshot of the USGS Flood Database map, even if no events are present.

Appendix C – Hydraulic Model – Natural Stream - IN THIS ORDER - Tables, Cross section plots, Profile plot, Report

1. **TABLES** - Print out SEPARATELY the tables that you take your numbers from for your summary sheet and comparison table.

Reach	River Sta	E.G. US.	Min El Prs	BR Open Area	Prs O WS	Q Total	Min El Weir Flow	Q Weir	Delta EG
		(ft)	(ft)	(sq ft)	(ft)	(cfs)	(ft)	(cfs)	(ft)
U.S. 77	575	1045.97	1059.10	1833.91		1302.00	1059.46		0.15
U.S. 77	575	1050.58	1059.10	1833.91		2712.00	1059.46		0.15
U.S. 77	575	1052.66	1059.10	1833.91		3924.00	1059.46		0.19
U.S. 77	575	1054.90	1059.10	1833.91		5830.00	1059.46		0.25
U.S. 77	575	1055.51	1059.10	1833.91		6582.00	1059.46		0.28
U.S. 77	575	1056.20	1059.10	1833.91		7538.00	1059.46		0.32
U.S. 77	575	1057.44	1059.10	1833.91		9434.00	1059.46		0.40
U.S. 77	575	1060.67	1059.10	1833.91		14801.00	1059.46	988.46	0.99

Reach	River Sta	E.G. US.	W.S. US.	Br Sel Method	Energy EG	Momen. EG	Yarnell EG	WSPRO EG	Prs O EG	Prs/Wr EG	Energy/Wr EG
		(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
U.S. 77	575	1045.97	1045.85	Energy only	1045.97						
U.S. 77	575	1050.58	1050.43	Energy only	1050.58						
U.S. 77	575	1052.66	1052.46	Energy only	1052.66						
U.S. 77	575	1054.90	1054.62	Energy only	1054.90		1054.68				
U.S. 77	575	1055.51	1055.19	Energy only	1055.51		1055.27				
U.S. 77	575	1056.20	1055.84	Energy only	1056.20		1055.96				
U.S. 77	575	1057.44	1057.05	Energy only	1057.44		1057.14				
U.S. 77	575	1060.67	1060.44	Press/Weir	1060.55				1060.87	1060.67	



2. **CROSS SECTION PLOTS** of HEC RAS models (***3 per page landscape***)

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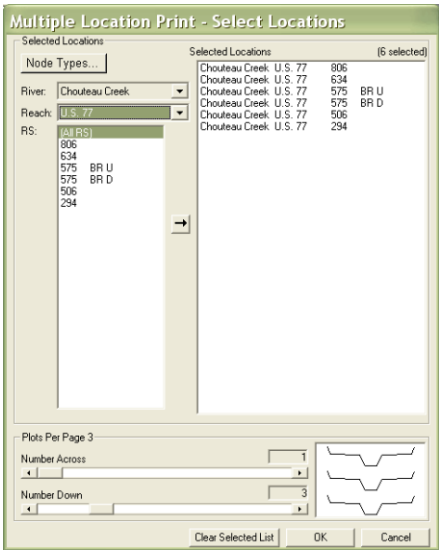
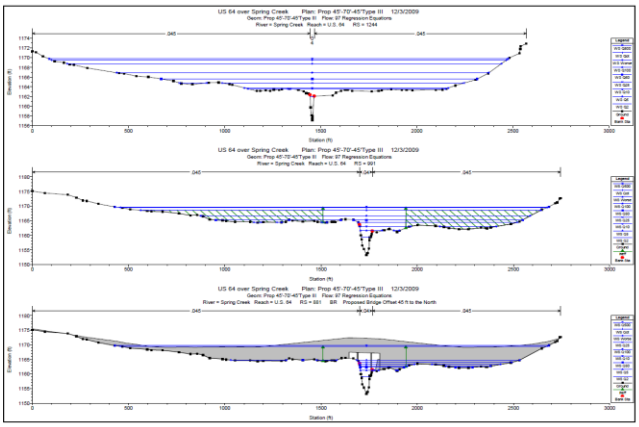
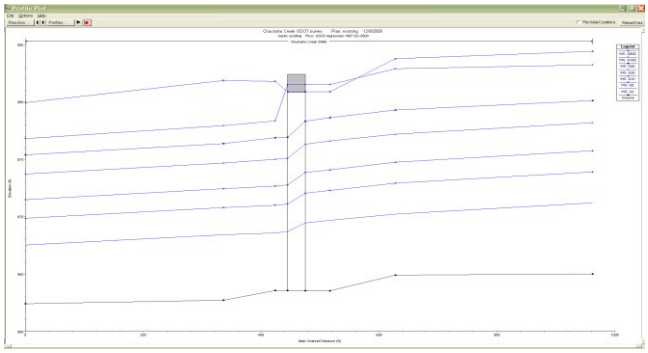
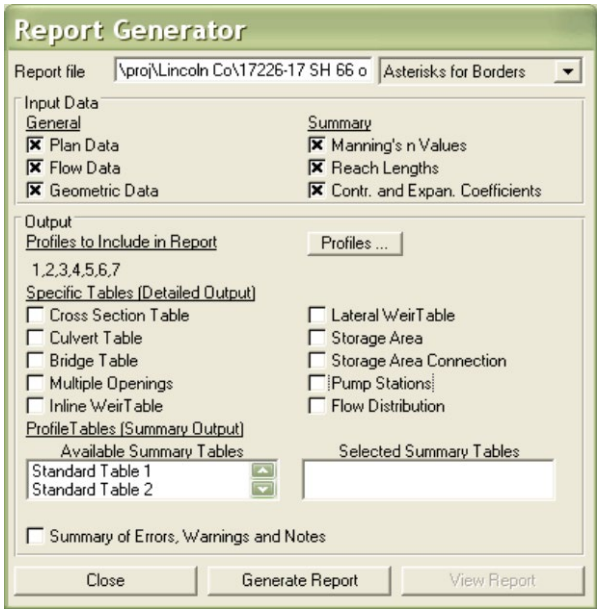




3. **PROFILE PLOTS** from HEC RAS



4. Provide **REPORTS** generated in HEC RAS including input for model for **all** seven profiles. PLEASE NO CROSS SECTION OUTPUT; THIS TAKES UP TOO MUCH SPACE



Appendix D – Hydraulic Model –Existing Bridge–SEE NATURAL STREAM MODEL ABOVE

Appendix E– Hydraulic Model – Proposed Bridge–SEE NATURAL STREAM MODEL ABOVE

Appendix F– Hydraulic Model – Detour Bridge –Include either HY-8 or HEC RAS runs

Appendix G - Scour - includes scour report, soils data used.

Appendix H - Hydraulic P & P, Bridge Layout, or RCB Flowline profile (See examples) **THESE ARE NOT PLAN SHEETS**