APPENDIX D

HYDROLOGIC AND HYDRAULIC REPORT CHECKLIST

HYDROLOGIC AND HYDRAULIC REPORT CHECKLIST

Project: _____

Subject: _____ Date:

Reviewer(s): District:

DESCRIPTION	ITEM PRESENT YES	NO	N/A
A.1. LOCATION MAP			
Acceptable forms (check one):			
☐ (1) USGS quadrangle map (or map of equal detail)			
☐ (2) Aerial photographs			
Required information:			
(1) Project location			
(2) Drainage area			
(3) River reach			
A.2. EXISTING STRUCTURES (IF APPLICABLE)			
a. Identify existing structures including upstream and downstream of site (by map).			
b. Must describe:			
(1) Type of structure, span lengths, pier orientation			
(2) Cross section beneath structure - stream clearance and skew			
(3) Flood history, highwater marks (with dates), nature of flooding, damages (source)			
c. Compare stream and existing structure locations with the proposed crossing.			
d. Indicate whether existing structures are to remain in place.			
A.3. FLOOD INFORMATION			
a. Elevations of all available highwater marks along the stream w/ dates of occurrence			
b. Critical flood elevations of interest (possible damage)			
c. Local testimony of flooding (if available)			
A.4. ENVIRONMENTAL CONCERNS			
a. Comments on fish habitats or other environmental concerns.			
(1) Warm water or cold water stream?			
(2) Trout stocked?			
(3) HQ/EV watershed?			
b. Continuous or intermittent stream?			
A.5. HISTORY OF DRIFT, ICE AND STREAM BANK STABILITY			
a. Comments on stability of stream banks (i.e. exposed soil, slumping, tilting trees, etc.)			
b. Type of material in stream bed (i.e. sand, gravel, large cobbles, etc.)			
A.6. PHOTOGRAPHS			
a. Existing structures			
b. Upstream and downstream channel			
c. Roadway station ahead and station back			
A.7. FACTORS AFFECTING WATER STAGES			
a. High water from other streams.			
b. Reservoirs (existing or proposed) and approximate date of construction.			
c. Flood control projects (give status, e.g. control structures, operator, and operating policy).			
d. Other controls.			
A.8. DEBRIS			
Indicate if debris can be a problem at the structure site.			
A.9. SITE INSPECTION RECORDS			
Dates and other information relative to site inspection(s) made by the engineer			

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Subject: _____ Date:

Reviewer(s): District:

DESCRIPTION	ITEM PRESENT YES	NO	N/A
A.10. LINE AND GRADE APPROVAL			
Indicate date of Line and Grade Approval (Design Field View).			
B. HYDROLOGIC ANALYSIS			
1. Show drainage area above proposed crossing (note method of determining area)			
2. Supply flood records (if applicable)			
3. Acceptable hydrology methods			
☐ (1) Use of stream gage records (WRC method)			
☐ (2) Rational Method (up to 200 acres)			
(3) Regression models/equations			
☐ - PSU-IV (Comparison Only)			
☐ - USGS 00-4189			
☐ (4) HEC-1 (may be used within the Watershed Modeling System program)			
☐ (5) TR-55 (10 acres to 3.1 sq. miles; can also be used within WMS)			
☐ (6) EFM-2 (1 to 2000 acres)			
4. Show flood-frequency curve for the site.			
5. Show stage-discharge-frequency curve for the site (existing and proposed conditions).			
C. HYDRAULIC ANALYSIS			
a. Is the proposed project in a FEMA study area? (circle one) yes no			
(1) Original FIS study and flood map(s) provided			
(2) Study is referenced in the text			
(3) Proposed structure encroaches on (check one):			
☐ - 100-year floodplain (floodway fringe)			
☐ - 100-year floodway			
☐ - neither			
(4) Is there an increase in the 100-year water surface elevation? yes no			
b. Existing vs. Proposed conditions:			
(1) velocities			
(2) backwater elevations			
(3) bridge opening sizes			
c. Acceptable hydraulic methods for the site (check the method used)			
☐ (1) HEC-RAS (bridge and culvert design, water surface profiles)			
☐ (2) HY-8 (culvert design)			
☐ (3) HDS-5 (culvert design - equivalent to HY-8)			
☐ (4) HEC-2 (water surface profiles)			
☐ (5) WSPRO (only use when a FEMA map revision is necessary)			
☐ (6) Visual Urban (HY-22 - mostly urban drainage applications)			
☐ (7) Other List: _____			
d. Model validation			
☐ (1) Calibration with known high water marks or storm events			
☐ (2) Explanation of model warnings and errors			
e. Estimated scour depths - contraction, pier and abutment (refer to Design Manual, Part 4)			
f. Riprap sizing for bank, pier and abutment protection			
g. Temporary Stream Crossings, Access Roads or Cofferdams			
D. RISK ASSESSMENT			
Narrative description of factors related to the 100-year flood			
E. SUMMARY DATA SHEET			
Complete all information listed in Design Manual, Part 2, Section 10.7.E (Figure 10.7.1)			

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DESCRIPTION	ITEM PRESENT YES	NO	N/A
F. PRELIMINARY COST ESTIMATE			
Preliminary cost estimates of the proposed structure or channel change			
G. DRAWINGS			
1. Roadway plans and profiles indicating the following information:			
a. Layout of existing and proposed structures, stream channels and wetlands.			
b. Adjacent topographic features with key elevations or contours shown.			
c. Flood limits of the existing and proposed structures and/or channels.			
d. Flood easement (if provided)			
e. Temporary stream crossing, access road, cofferdam, diversion facility, etc.			
f. The magnitude, frequency and pertinent water surface elevation for specified floods.			
2. Profile of stream showing bed slope, normal water surface, and flood water surfaces.			
3. Cross-sections perpendicular to flood flow:			
a. upstream (500 ft.)			
b. Immediately upstream of proposed and/or existing crossings.			
c. Immediately downstream of proposed and/or existing crossings.			
d. downstream (500 ft.)			
4. Plan drawing showing the location and orientation of all cross sections used for backwater analysis (should be to scale and show contouring and all important hydraulic features).			
5. Floodway maps and flood profiles where there are detailed FEMA Flood Insurance Studies.			
6. Wetland Mitigation Plans			