WFLHD SUPPLEMENT 7.1-1

7.1 GENERAL

Add the following:

Hydraulics Standard Operating Procedures

1. Major Culvert PS&E Deliverables

The Hydraulics section should provide the Design section with schematic drawings with sufficient information to take the drawing to final layout. This would typically include the following:

1. Culvert length, size, slope, and elevations.

2. If applicable, fish passage features within the culvert barrel such as baffles and stream bed materials. This information should include baffle dimensions, types, and spacing. For stream bed materials, this information includes gradations, thicknesses, and slopes.

3. Inlet and outlet treatment types (concrete, riprap, etc.) with dimensions and thicknesses relative to the proposed culvert. Outlet treatments include energy dissipaters and aprons.

Once the initial schematic drawings have been provided, design will finalize the drawing in MicroStation/GEOPAK and submit the drawings as part of the next review package.

2. Riprap PS&E Deliverables

The Hydraulics section should provide the Design section with the following:

1. For longitudinal floodplain protection, plan and typical section views with dimensions and locations relative to the proposed road alignment. The dimensions should include riprap thicknesses, class type, slopes, filters, and elevations.

2. For bridge protection, plan and typical section views with dimensions and locations relative to the proposed bridge. The dimensions should include riprap thicknesses, class type, slopes, filters, and elevations.

3. Miscellaneous PS&E Deliverables

The Hydraulics section should provide Design with sketches and drawings that include dimensions, locations, and relevant design features for such items as channel changes, stream restoration, barbs, low water crossings, and if necessary, curb and gutter systems. The Hydraulics section should also give Design relevant hydraulic information for inclusion in the PS&E package. The provided hydraulic information should generally be placed on the profile view of the plan and profile sheets.

For major culverts, this information includes the design flood and related inlet headwater or headwater to diameter ratio. For projects paralleling major rivers, this generally includes the water surface profile for the Q2 and Q100. For bridges, this information includes the design flood and related water surface elevation.

4. General PS&E Comments

To complete the above work, Design should provide Hydraulics with plan, profile, and cross-sections of the proposed project. Hydraulics will get DSL, TIN, and other relative topographic files from Survey.

When necessary, hydraulics will develop or at least aid in the development of estimates for determining culvert and riprap alternative analysis. This approach also applies to cost comparisons of bridges versus culverts and various alternatives for floodplain encroachments.

Hydraulics should aid in the SCR development hydraulic related work items. Recognizing that PS&E packages could vary from project to project, the Hydraulics section should insure that the PS&E package contains the content of the proposed culvert and riprap recommendations within the preferences of the responsible Designer.

Most PS&E packages include many of the same standard and detailed drawings. Hydraulics and Design should have a checklist of drawings for incorporation into the PS&E package. Both sections should insure as much consistency as possible from project to project as to the type and location of drawings placed within the PS&E package.