

HYDRAULIC DESIGN ADVISORY

HDA 07-02

Date: December 10, 2007

**SUBJECT: COUNTERSINKING CONSIDERATIONS FOR SINGLE
AND MULTIPLE BARREL CULVERTS**

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Culverts constructed in Army C.O.E. jurisdictional stream beds are required to have the upstream and downstream inverts set (countersunk) below the natural stream bed elevation to simulate natural stream bed establishment within the culvert and to meet the requirements of the environmental permitting process. If the culvert is greater than 24" (or equivalent) in diameter, the inlet and outlet ends shall be countersunk a minimum of 6" below the natural stream bed. If the culvert is 24" (or equivalent) or less in diameter, the inlet and outlet ends shall be countersunk a minimum of 3" below the natural stream bed. IIM-LD-214.2 provides detailed information regarding this requirement and should be referred to for further guidance.

The invert elevations noted in the drainage description for the culvert should be specified at the appropriate countersunk elevations. A notation should also be included in the drainage description for the culvert indicating that the invert elevations reflect countersinking, e.g., "The invert elevations noted reflect a minimum of * countersinking." (* - 3" or 6" as required for culvert size.) This will clearly communicate to the field personnel that the proposed invert elevations are intentionally set lower than the streambed.

The fact that the culvert is to be countersunk should also be included in the remarks column of the Drainage Summary.

Drainage Design Memorandum 2 (DDM2) in the VDOT Drainage Manual will be revised in the near future to incorporate this guidance. In the interim, this HDA shall be authorization to incorporate this guidance immediately on all applicable projects.