

**WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
DESIGN DIRECTIVE**

**DD-408
CASCADES IN ROCK CUTS**
March 4, 1998

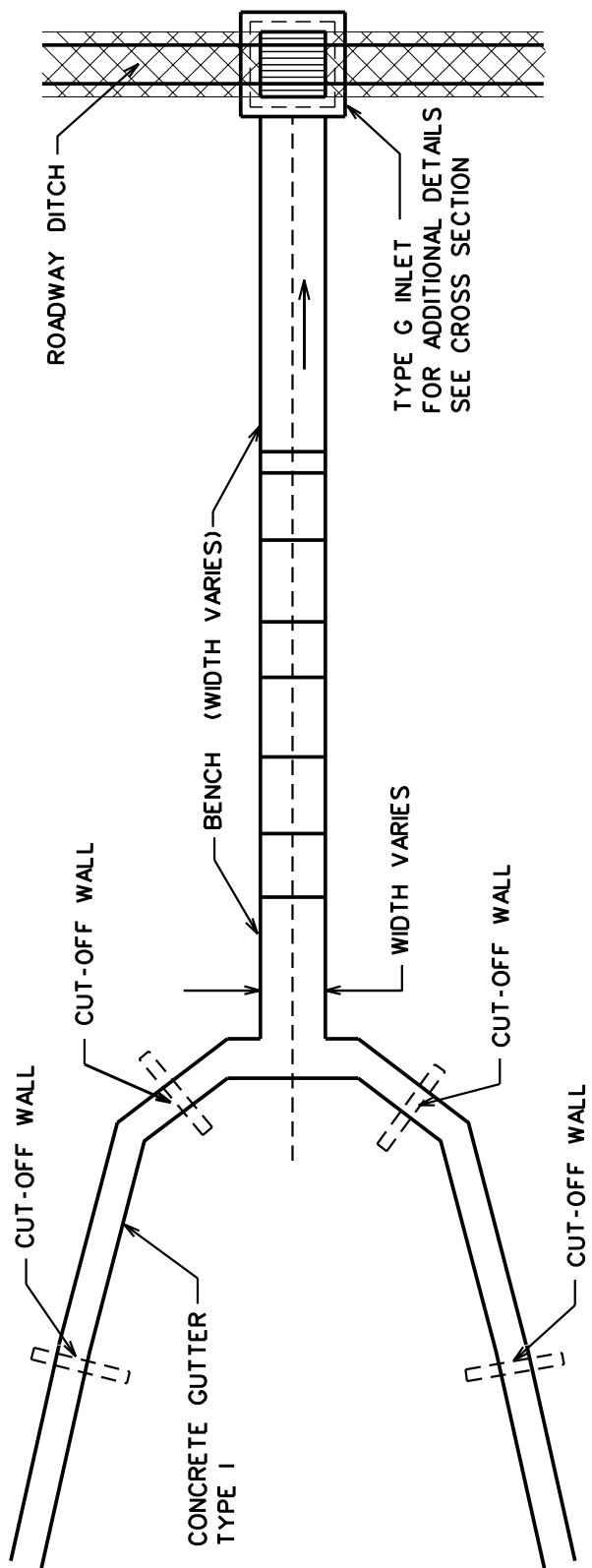
Designers are encouraged to investigate and consider cascades in rock cuts in lieu of slope pipes or flumes, in order to reduce maintenance costs.

Cascades in rock cuts shall be used only in areas where the bedrock is medium hard, hard sandstone, limestone, or hard shale. The geological information shall be included in typical details for cascades.

Attachment A is a typical cascade detail, this detail is provided as a guide and should be modified if necessary on a project-by-project basis.

Attachment

TYPICAL CASCADE DETAIL



1. REFER TO THE CROSS SECTIONS FOR THE LENGTH OF CONCRETE GUTTER AND BENCH WIDTHS.
2. THE DIMENSIONS FOR THE CASCADE SHOWN ON THE CROSS SECTIONS ARE TO BE CONSIDERED AS APPROXIMATE AND MAY BE VARIED DURING CONSTRUCTION TO CONFORM WITH NATURAL PLANES OF STRATIFICATION ENCOUNTERED IN THE ROCK.
3. FOR ELEVATIONS VIEW SEE CROSS SECTION.

TYPICAL CASCADE CROSS-SECTION

