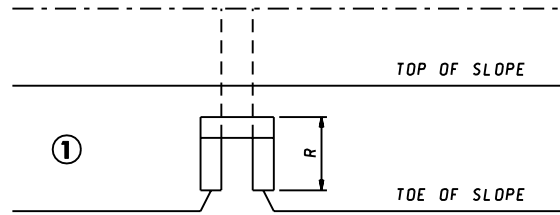


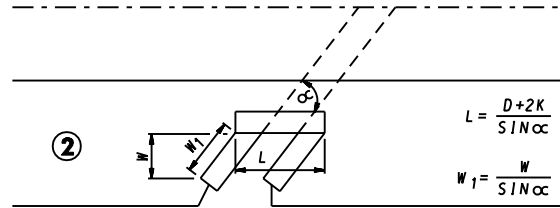
CASE ①

THIS CONDITION IS COVERED BY THE TYPE "G" ENDWALL.



CASE ②

WHEN A PIPE IS TO BE PLACED ASKEW TO FOLLOW THE NATURAL WATER COURSE THE STANDARD "G" ENDWALL SHOULD BE MODIFIED BY LENGTHENING THE HEADWALL TO ALLOW FOR THE INCREASED AREA OF THE PIPE DUE TO THE ASKEW AND THE WINGS LENGTHENED TO CARE FOR THE SLOPE.

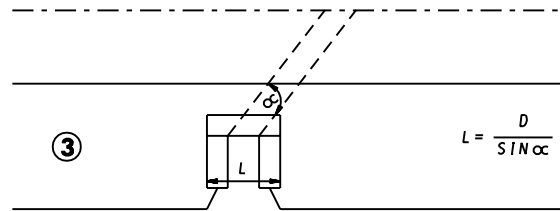


$$L = \frac{D+2K}{\sin \alpha}$$

$$W = \frac{W}{\sin \alpha}$$

CASE ③

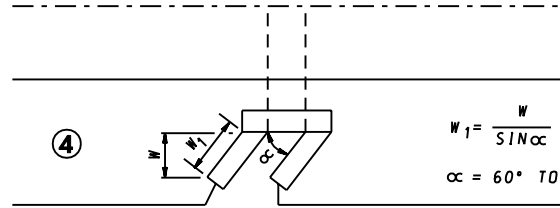
WHEN IT IS NOT PRACTICAL TO PLACE THE ENDWALL ON THE OUTLET END IN LINE WITH THE ENDWALL ON THE INLET END IT IS NECESSARY TO ASKEW THE PIPE. THIS REQUIRES THE LENGTHENING OF THE HEADWALL ONLY TO ALLOW FOR THE INCREASED AREA OF THE PIPE DUE TO THE ASKEW. THE LENGTH OF THE WINGS ARE STANDARD.



$$L = \frac{D}{\sin \alpha} + 2K$$

CASE ④

WHEN A WATER COURSE IS ASKEW AND IT IS MORE ECONOMICAL OR BETTER PRACTICE TO PLACE THE PIPE AT RIGHT ANGLES TO THE CENTERLINE AND RECUT THE OUTLET THE "G" ENDWALL CAN BE USED BY PLACING THE WINGS PARALLEL TO THE COURSE AND LENGTHENING THE WINGWALLS ONLY. THE HEADWALL REMAINS STANDARD.

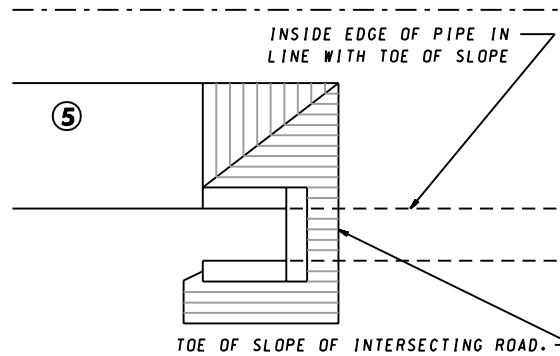




$$W = \frac{W}{\sin \alpha}$$

$$\alpha = 60^\circ \text{ TO } 90^\circ$$

CASE ⑤

THIS CONDITION APPLIES WHEN A ROAD OR ENTRANCE INTERSECTS AT RIGHT ANGLES AND THE WATER COURSE IS PERPENDICULAR TO THE INTERSECTING ROAD OR ENTRANCE THE STANDARD "G" ENDWALL CAN BE USED.



| | | |
|--|---|---|
| SPECIFICATION | CATEGORY CODE ITEMS | |
| APPROVED |  DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT | |
|  State Highway Administration | APPROVAL • SHA REVISIONS | APPROVAL • FEDERAL HIGHWAY ADMINISTRATION |
| | APPROVAL 1-26-72 | APPROVAL 3-23-56 |
| | REVISED 10-1-01 | REVISED |
| | REVISED | REVISED |

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

STANDARD TYPE G ENDWALL MODIFICATIONS

STANDARD NO. MD 360.02